

## CONTENTS

**Fridman A.A.**

*Water-saving technology and efficient tariffs* 3

**Vinokurov V.I.**

*Innovative economy basic terms and definitions in the field of innovation* 12

**Reshetnikov E.G.**

*Socio-economic mechanism for regulating the differentiation of food consumption: development of the institutional environment* 48

**Gurvich E.T.**

*Prilepsky I.V. What determined the depth of the recession during the crisis period?* 53

**Dolgopyatova T.G.**

*Concentration of property in Russian industry: evolutionary changes at The micro level* 76

**Muzychuk V.Yu.**

*The draft law "on education": iteration number 2* 91

**Libman A.M.**

*Frankfurt School of Finance and Management* 100

**Yusifov Murad Yusif oglu**

*Application of economic and mathematical methods in the study of inflationary processes in Azerbaijan: SARIMAX model and extended Fourier series model* 118

**Solanko L., Fungachova Z.**

*How successful are Russian banks in financial intermediation?* 129

**Maleva T.M.**

*Sinyavskaya O.V. Raising the retirement age: pro et contra*

131

**T.L. Klyachko**

*Vocational education: reforms again*

147

**Polterovich V.M.**

*Economics in Russia: the costs of globalization and the reform of the  
Russian Academy of Sciences*

162

## WATER SAVING TECHNOLOGY AND EFFICIENT RATES

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A.A. Friedman

*State University Higher School of Economics, Moscow*

Email: [afriedman@mail.ru](mailto:afriedman@mail.ru)

*A dynamic model has been built for the distribution of water resources coming from two natural sources (groundwater and surface water) in the presence of a circulating water supply technology with a given throughput capacity. It is shown that with a constraining restriction on the intensity of the use of technology, it is possible to temporarily refuse to take water from a natural source with a subsequent return to it in the future. It is shown that the effective trajectory of water consumption can be decentralized with an appropriate choice of tariffs. Comparison of effective tariffs for two consumers, differing only in the presence of recycling water supply technology, is carried out.*

*Key words:* depleted resources, circulating water supply, decentralization.

*Keywords:* exhaustible resources, water recycling, decentralization.

### 1. Introduction

To meet water needs, economic agents use various natural sources of water resources. In particular, in the Russian Federation about 80%<sup>2</sup> water is taken from surface sources, and the remaining demand is met by underground (12%) and sea (7%) waters. The main consumer of water is industry, which accounts for 65% of the water used.<sup>1</sup> ...

As can be seen from Table 1, industrial enterprises combine several methods of water supply, using, along with water intake from various natural sources, the technology of circulating water supply. The intensity of the use of these technologies varies significantly from industry to industry, but on average, the technology of recycling water gives the industry of the Russian Federation about 80% savings.

The technology of recycling water supply allows the water taken from a natural source after working out to be sent back to production process. Thus, in a certain sense, water from a natural source serves the consumer as a durable

<sup>1</sup> State report, 2009, tab. 3.40 on p. 227 of the model is valid only in relation to the dynamics of the price of the resource stock, and not the flow. However, the results obtained in this work cannot be directly extended to the technology of circulating water supply, since water needs some processing for reuse in the production process, i.e. we must also take into account the costs associated with the use of recycled water technology

product with the only difference that its subsequent consumption is associated with certain additional costs.

According to the model of exploitation of a depleted durable resource proposed in (Levhari, Pindyck, 1981), for such resources, a distinction should be made between the cost of the consumer and the price of a unit of the stock. The traditional Hotelling rule in this

Attempts to consider the impact of recycling of secondary raw materials on the trajectory of extraction of depleted resources have been undertaken in a number of studies. For example, Hoel (1978) analyzed the relationship between the production of an inexhaustible substitute resource and the extraction of a depleted resource, taking into account the different effects of these processes on environmental pollution. However, this work did not introduce a relationship between the volume of recyclable materials available for processing and the previously extracted resource, but, on the contrary, it was assumed that the volume of recyclable materials available for processing was infinitely large.

In (Ding, Song, 2006), a model was built, where the relationship between the volume of the extracted and the resource available for subsequent processing is explicitly assumed. However, the volume of the processed resource is not a choice variable in the model, but is set exogenously as a fixed production share.

In this paper, we will consider how the technology of recycling water supply should be taken into account in the formation of water tariffs. The relevance of this issue is explained by the fact that even in developed countries, as a rule, there is no water market, and therefore market mechanisms for pricing water resources do not work. Ineffectiveness of tariffs leads to irrational use of water resources, which can provoke a water crisis.

А.А. Фридман

Таблица 1  
Источники воды и экономия воды  
за счет оборотного водоснабжения по отраслям РФ в 2008 г.

Вид производственной деятельности	Забор пресной воды		Экономия свежей воды <sup>4</sup> , %
	из поверхностных источников, %	из подземных источников, %	
Производство и распределение электроэнергии, газа и воды	86	14	72
Сельское хозяйство, охота и лесное хозяйство	96	4	78
Обрабатывающие производства	86	14	91
Добыча полезных ископаемых	23	77	94
Рыболовство и рыбоводство	97	3	64
Строительство	...	...	50
Транспорт и связь	92	8	58
Предоставление прочих коммунальных, социальных и персональных услуг	84	16	20
Итого по России	86	14	79

Источник: Государственный доклад, 2008, табл. 3.1, 3.2, с. 170–172.

There are many theoretical studies dealing with water pricing issues. They addressed the following questions: should tariffs be based on average or marginal costs of water supply (Riordan, 1971; Brill, Hochman, Zilberman, 1997); how seasonal fluctuations in water demand and supply should be taken into account (Zarnikau, 1994; Schuck, Green, 2002); what are the optimal tariffs for asymmetric information regarding the types of water consumers (Elnaboulsi, 2009); how to take into account the effect of depletion of water resources (Moncur, Pollock, 1988); how tariffs should depend on the spatial differentiation of water consumers (Chakravorty, Umetsu, 2003).

In (Fridman, 2009) it is shown that for different consumers the rent component of effective tariffs varies in accordance with the coefficient of irrevocable water consumption. The calculations were based on the assumption that waste and non-utilized water in the process of consumption goes back to a natural source. However, the technology of recycled water supply implies the absence of a return flow of water, which entails several changes in relation to the components of the effective tariff. Water taken from a natural source provides not

only an immediate benefit from water consumption, but also has a residual value (non-reclaimed water can be reused after appropriate treatment). However, due to the absence of return flows, there is no need for the costs of cleaning the discharged (unused in the process of consumption) water to the standard level. Since in Russia most of the water is consumed by industrial enterprises, and these enterprises use both natural waters and the technology of recycled water supply, the question of the formation of effective tariffs, taking into account the peculiarities that arise when using the technology of recycling water supply, seems to be very relevant.

In sect. 2 shows a formal model describing the efficient use of water from two natural sources (groundwater with a given, but replenished supply, and surface water) in the presence of the technology of circulating water supply with a given

## **2. Model with recycled water supply technology**

Consider a region where, as a source of usable water<sup>6</sup> groundwater, the supply of which is limited, and surface water with a deterministic volume of annual runoff (sufficient to meet current demand) may appear. The agent can use the technology of recycling water supply with a fixed capacity.

The groundwater supply is limited and at the initial moment is equal to  $S_0$ ... At each moment of time, there is a deterministic replenishment of the stock by the amount $g_t$ . Denoting water intake from underground sources at time  $t$  through  $g_t$ , we obtain the equation for the dynamics of this stock:  $\Delta S_{gt} = -g_t$ ... Since the stock at each moment of time must be non-negative, then when the stock is completely depleted, the water intake from underground sources is limited by the level of their natural replenishment. Note that not all of the withdrawn water is utilized in the process of consumption, but in the presence of recirculating water supply technology, the remaining water does not go back to the source, but after appropriate processing it enters production again.

Let's introduce the recycling water supply technology into the model. These technologies are most widely used in industries where water serves as a cooler, and this direction of water use is predominant for recycling water supply systems, and therefore this direction is considered as a model in this work.<sup>8</sup>... Apparently, the widespread use of recycling water supply technologies when pumping water for cooling equipment is associated with the low marginal costs of recycling water supply technology, since in this case the lion's share of costs is formed from the costs of cooling the waste water. Cooling can be carried out:

1) in specially created reservoirs (ponds, pools, etc., where water is accumulated, cooled, and then used as needed, in this case, the capacity limitation of the corresponding reservoirs should be taken into account);

2) without storage (for example, using cooling towers or radiators, then the capacity of the cooling devices is of decisive importance);

3) a combination of two cooling methods nine...

If only a fraction of the water is disposed of ( $0.1\alpha$ ), then in the presence of a circulating water supply system, the remaining part ( $1-\alpha$ ) available for re-use after appropriate processing, which comes with a marginal cost  $c_z$ . We will assume that the company can use the treated waste water immediately or store it in a tank and use it in production after some time. At the same time, there is a limitation on the throughput of wastewater treatment technology. Letting  $zt$  the volume of water passing through the circulating water supply system at time  $t$ , we obtain the following equation for the dynamics of the stock of waste water: This equation of dynamics assumes that there is no need to instantly consume the formed stock of waste water, i.e. this water can accumulate in a reservoir. Natural or artificially created ponds or basins can serve as such reservoirs. Since the volume of these reservoirs is limited, the water supply cannot exceed the storage capacity for a given reservoir. We will not introduce this limitation explicitly, assuming that the volume of these reservoirs is large enough and the corresponding limitation is not restrictive. This premise is quite reasonable if the water recycling technology is the cheapest water source available.

The recycling water supply system is associated with rather high installation costs, but at the same time the marginal costs can be very low, since transport costs in this case are absent, and in the case when the technological consumption process under consideration is characterized by a low level of pollution (which, for example, is true when using water as a coolant), the costs are low. Note that these costs are still non-zero. First, the waste water can be contaminated with mechanical impurities during the cooling process in reservoirs. Secondly, during transportation through pipelines and in contact with heat exchange equipment, corrosion products may appear in the circulating water, which reduces the efficiency of the cooling process. Waste water pre-treatment and treatment,

So, if the circulating water supply corresponds to the cheapest resource, then this resource will always be selected first. Taking into account the absence of the initial stock of waste water, this means that this resource will not accumulate. In this case, the storage capacity will not be involved at all. However, if there is a limitation on the throughput of the recycling water supply technology, if at some point the intensity of the technology operation reaches the capacity

limit, a part of the waste water will still go to the reservoir for storage. Moreover, if the throughput is not too small (namely, this case is considered in the article), then, as will be shown in section. 4, waste water accumulation is BPechangeable: the tank will not be used in a stationary state. Due to these considerations, we will not introduce an explicit restriction on the capacity of the reservoir.

Let  $l_t$  the volume of water intake from surface sources at time  $t$ , and after  $c_l$  - marginal costs;  $c_l = \text{const}$ . The model assumes that the volume of river flow is large enough to meet the needs of the region, and therefore we will not introduce a limitation on the volume of flow, i.e. in this case, surface water acts as an in-exhaustible substitute resource.

Let the marginal costs of water supply for each source be constant, and the following relationship holds  $l_{ccc} < z$ , where the subscript indicates the type of water source. Let us comment on the introduced premises regarding the relationship between the marginal costs of various natural sources. As a rule, groundwater requires less water treatment costs compared to surface water, which generates lower marginal costs, and this ratio can take place not only for drinking water, but for water used in industry. Usually, surface waters are characterized by higher pollution with mechanical impurities, oil products, metals, and also have a higher level of microbiological and radiological pollution. As a result, even when water is used in industry as a transport medium or as a coolant, there are significant treatment costs. For example, in the absence of cleaning from biological contaminants, the build-ups of biomass appearing in the pipes significantly reduce the thermal conductivity and require a periodic shutdown of the process for cleaning. In this case, preliminary water purification avoids production interruptions.

The above ratio of marginal costs can also take place with the same water quality, if groundwater reserves are located closer to consumers, while surface waters require transportation.

Naturally, in some cases, an inverse relationship between the marginal costs of surface and groundwater is possible, for example, with a very high salinity of groundwater or with their emergency pollution, but these situations are not considered in this article.

Note that, due to the lowest marginal costs, circulating water supply is the most preferable source of water, and therefore, in the absence of restrictions on the intensity of the application of this technology, efficiency requires continuous use of waste water. In principle, in this case, the capacity for storing waste water is not needed. However, if there is a limitation on the throughput of the technol-

ogy, it may be necessary to reduce the withdrawal of waste water, and in this case there is a need for water storage. The work does not explicitly introduce a restriction on the volume of the reservoir, since it is implicitly assumed that the capacity of the available reservoirs is sufficient to store the resulting stock of waste water.

If there are two identical resources in the economy that differ in marginal costs, then, in accordance with the Herfindahl principle, these resources should enter production sequentially, starting with the cheaper one. However, the peculiarity of our model is that the use of a cheaper technology of circulating water supply is possible only with the formation of a stock of waste water, which is initially absent in the economy. As will be shown below, this feature allows you to simultaneously use in production an expensive resource from a natural source and the technology of recycling water supply.

Let us show that in the case of a large throughput of the recycling water supply technology, groundwater will be used at each moment of time, and only in a situation when the recycling water supply technology has been operating at full capacity for a certain period, the water consumption needs can be satisfied without involving groundwater.

When comparing effective tariffs, two points should be noted. Recycling water supply technologies, on the one hand, allow saving on wastewater treatment costs, and on the other hand, in this case there is no return water, i.e. the coefficient of irretrievable water consumption becomes equal to one, which increases the rental component of the tariff.

Consider, for example, a region where there are two consumers, the only difference between which is the presence of the technology of recycling water supply in one and the absence of this technology in the other. Then the shadow estimate of groundwater will be the same, i.e.  $\lambda = \lambda^*$ . As a result, the effective tariff for an agent using circulating water supply, before reaching a stationary state, is characterized by a lower component associated with marginal costs, but a higher rental component. In addition, the availability of recycling water supply technology allows using a lower tariff in a stationary state due to the absence of costs for wastewater treatment.

### **Conclusion**

We have analyzed the problem of efficient use of natural sources of water resources and the technology of recycling water supply, provided that the intensity of attracting this technology is limited by its capacity. Since the use of a cheaper (in comparison with natural sources) technology of circulating water supply is possible only in the presence of waste water, then, as shown in Sec. 3

and 4, in this situation, expensive and cheap resources can be simultaneously involved, and this conclusion does not depend on the power level of the recycling water supply technology.

In the case of a restraining restriction on the intensity of the use of recycling water supply technology, a situation is possible in which at some point it is optimal to stop using groundwater and satisfy all needs only through recycling water supply, and after the exhaustion of the waste water supply, return to the operation of underground sources.

It is shown that in this model, a distinction should be made between the marginal benefit of current water consumption and the benefit from the last unit of water taken from a natural source, since it also includes an assessment of the increase in the waste water supply formed as a result of water use. Thus, effective water tariffs must reflect the marginal public benefit, and therefore will be higher than the marginal utility of current water consumption. The establishment of tariffs constructed in this way allows the efficient consumption trajectory to be decentralized.

The performed analysis of comparative statics for two consumers, differing only in the presence of recycling water supply technology, indicates that the tariffs for these agents will be different both in terms of marginal costs and in terms of the rental component. With a circulating water supply, there is no wastewater, and therefore the marginal cost is reduced. The absence of waste water means that there is no partial return of water to the natural source, i.e. the coefficient of irretrievable water consumption turns out to be equal to one, which increases the rental component of the tariff.

## REFERENCES

- Danilov-Danilyan V.I.** (2009): Water resources - a strategic factor in the long-term development of the Russian economy // Bulletin of the Russian Academy of Sciences. T. 79. No. 9. P. 789–798.
- Ivanov M.** (2008). Cooling and purification of circulating water // Communal complex of Russia. T. 48. No. 6. P. 82–86.
- Ponomarenko V.S., Yu.I. Arefiev**(1998): Industrial and energy cooling towers. M.: Energoatomizdat.
- Fridman A.A.** (2009): Effective pricing for water resources with heterogeneity of consumers // Economics and Mat. methods. T. 45. No. 4. P. 3–15.

- Brill E., Hochman E., Zilberman D.** (1997): Allocation and Pricing at the Water District Level // American Journal of Agricultural Econ. Vol. 79. No. 3. P. 952-963.
- Campbell MD** (1999): The Role of Environmental Technology in Developing, Maintaining and Protecting Ground-Water Supplies in the 21<sup>st</sup> Century. US Water Report, Saringa Group, San Francisco. P. 264-271.
- Chakravorty U., Umetsu Ch.** (2003): Basinwide Water Management: a Spatial Model // Journal of Environmental Econ. and Management. Vol. 45. No. 1. P. 1-23.
- Ding Y., R. Song** (2006): Effects on Non-Renewable Resource Exploitation, a Dynamic Comparative Model // Asian Social Science. Vol. 2. No. 12. P. 36-40.
- Elnaboulsi JC** (2009): An Incentive Water Pricing Policy for Sustainable Water Use // Environmental Resource Econ. Vol. 42. P. 451-469.
- Hoel M.** (1978): Resource Extraction and Recycling with Environmental Costs // Journal of Environmental Econ. and Management. Vol. 6. P. 220-235.
- Levhari D., RS Pindyck** (1981): The Pricing of Durable Exhaustible Resources // *The Quarterly Journal of Econ...* Vol. 96. No. 3. P. 365–378.
- Moncur JE, RL Pollock** (1988): Scarcity Rents for Water: a Valuation and Pricing Model // Land Econ. Vol. 64. No. 1. P. 62–72.
- Riordan C.** (1971): Multistage Marginal Cost Model of Investment-Pricing Decisions: Application to Urban Water Supply Treatment Facilities // Water Resources Res. Vol. 7. No. 3. P. 463–478.
- Schuck E., Green G.** (2002): Supply-Based Water Pricing in a Conjunctive Use System: Implications for Resource and Energy Use // Resource and Energy Econ. Vol. 24. No. 3. P. 175-192.
- Swierzbinski JE, Mendelsohn R.** (1989): Exploration and Exhaustible Resources: The Microfoundations of Aggregate Models // International Economic Rev. Vol. 30. P. 175-186.
- Zarnikau J.** (1994): Spot Market Pricing of Water Resources and Efficient Means of Rationing Water Resources During Scarcity // Resource and Energy Econ. Vol. 16.No. 3. P. 189–210.

**INNOVATIVE ECONOMY  
KEY TERMS AND DEFINITIONS IN THE SPHERE OF  
INNOVATION**

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V. I. Vinokurov,

c. e. Sci., Leading Researcher at the Center for Research and Statistics of  
Science (TsISN) of the Ministry of Education and Science of Russia and the Rus-  
sian Academy of Sciences

E-mail: vinokur@yandex.ru

*The article presents a systematized review of the main terminological and conceptual apparatus used in domestic and foreign statistical practice in the study of phenomena and processes in the field of innovation. The differences in the interpretations of the above terms and definitions, which are available in Russian sources and the Oslo Guide, are indicated.*

*In article the systematized review of the basic terminological and conceptual device used in domestic and foreign statistical practice at studying of the phenomena and processes in the field of innovations is submitted. Differences in treatments of the given terms and the definitions, available in the Russian sources and the Oslo Manual are designated.*

It is generally recognized and does not need additional justification for the assertion that there is no alternative for Russia to an innovative way of development.

At the same time, in various circles of Russian society, in our opinion, there is a certain misunderstanding of the essence of phenomena and processes in this area, largely due to insufficient knowledge of the terminological and conceptual apparatus.

The presented material contains an overview of the main terms and definitions in the field of innovation, which are given in the interpretation of domestic sources (regulatory and methodological documents, scientific literature) and the "Oslo Guidelines" (Proposed Guidelines for Collecting and Interpreting Technological Innovation Data: Oslo Manual. Paris: OECD, Eurostat, 1997). The Oslo Handbook is a valid methodological document prepared by the Organization for Economic Co-operation and Development (OECD) jointly with Eurostat and provides guidance on innovation statistics that are recognized as international statistical standards. For ease of perception, terms and definitions are not in alphabetical order,

1. The concepts of innovation and innovation.
2. Kinds and types of innovations.
3. Measuring innovation activity.
4. The cost of innovation.
5. Goals and effectiveness of innovation.
6. Diffusion of innovation.
7. General (external to organizations) conditions for innovation.

**Innovation** (innovation) - the end result of innovation, embodied in the form of a new or improved product introduced on the market, a new or improved technological process used in practice or in a new approach to social services. (Statistics of Science and Innovation: A Brief Terminological Dictionary. M.: TsISN, 1998.) clear quality advantages when used in the design, production, marketing, consumption and disposal of products, providing additional economic (cost savings or additional profit) and / or social benefit in comparison with the previous product or organizational-economic form. (Appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond.")

**Innovation** (innovation) - the end result of innovation, which has received implementation in the form of a new or improved product sold on the market, a new or improved technological process used in practice. (Concept of the innovation policy of the Russian Federation for 1998-2000, approved by the Decree of the Government of the Russian Federation of July 24, 1998 No. 832.)

**Innovations** - a complex and diversified activity with many interacting components. Determining the composition of an innovation is complicated by the fact that most products and, of course, the processes that create them are complex systems. Innovation defines changes in the properties and performance characteristics of the product as a whole, and changes in the components of the product that increase its effectiveness, including the nature of the services it provides. Innovation is at the heart of economic progress. According to I. Schumpeter, "radical" innovations determine the appearance of major changes in the world, while "incremental" innovations fill the process of changes continuously. Schumpeter has proposed a list of the different types of innovation (see R. Nelson and S. Winter (1982). An Evolutionary Theory of Economic Change. Belknap Press of Harvard University Press).

- introduction of a new product or a qualitative change in an existing product;
- process innovation new to the industry;
- opening of a new market;

- development of new sources of supply of raw materials or other investments
- changes in the business organization.

The Oslo Guide deals only with “technological” innovations, which require objective improvements in product performance.

The minimum condition for accounting as innovation is that the product or process must be new (or significantly improved) to the firm (it does not have to be new to the whole world)

**A comment.** In domestic practice, innovation is considered as the end result (or simply the result) of innovative activity (see the list of results of innovative activity below), in foreign practice ("Oslo Guide") - as an activity, a process of change. In our opinion, the following definition can be proposed: innovation (innovation) is the result of innovation, embodied in the form of a new or improved product introduced on the market, a new or improved technological process used in practice, or a new or improved organizational and economic form, providing the necessary economic and (or) social benefit.

**Innovative activity** - the type of activity associated with the transformation of ideas (usually the results of research and development or other scientific and technological achievements) and a new or improved product introduced on the market into a new or improved technological process used in practice, or a new approach to social services. Innovation activity involves a complex of scientific, technological, organizational, financial and commercial activities, and it is in their totality that they lead to innovation. (Statistics of Science and Innovation: A Brief Terminological Dictionary. M.: TsISN, 1998).

**Innovative activity** - type of activity for the reproduction of search, fundamental (necessary part) and applied research, design and development work, marketing actions in order to involve their results in civil law circulation for implementation in the form of an innovative product. This is a single, within the public and private sector, an integrated scientific and technological, organizational, financial, investment, production and marketing process through which ideas and technologies are transformed into technologically innovative products (services) and processes (new production methods) that have commercial value (commercial demand and commercial use in the market), as well as in new directions of using existing innovative products and services, in the formation of innovative markets.

**Innovation activities include:**

- performing research, development or technological work to create an innovative product;

- complex scientific and technological, indicative planning and target programming, organization and regulatory support of work on the creation of an innovative product;
- technological re-equipment and preparation of production for the release of an innovative product (service), technology;
- testing and mastering the innovative product by the consumer;
- technology commercialization process management;
- activities to promote an innovative product to the domestic and world markets, including legal protection of the results of intellectual activity used in the product;
- creation and development of innovation infrastructure;
- transfer or acquisition of rights by the Russian Federation or other rightholders to objects of intellectual property, including their involvement in civil law circulation;
- expertise, consulting, information, legal and other services (including the organization of financing for innovative activities) for the creation and implementation of a new and improved innovative product.

(Appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond.")

**Innovative activity** - a process aimed at the implementation of the results of completed research and development or other scientific and technical achievements into a new or improved product sold on the market, into a new or improved technological process used in practice, as well as related additional research and development ... (Concept of the innovation policy of the Russian Federation for 1998-2000, approved by the Decree of the Government of the Russian Federation of July 24, 1998 No. 832.)

**Innovative activity** - performance of work and (or) provision of services for the creation, development in production and (or) practical application of new or improved products, new or improved technological process. (Federal Law "On Innovation Activity and on State Innovation Policy" adopted by the State Duma on December 1, 1999, approved by the Federation Council on December 23, 1999 and rejected by the President of the Russian Federation on January 3, 2000)

**CCI**(technological product or process - ed.) innovation activity is an activity that encompasses all those scientific, technological, organizational, financial and commercial activities, including investments in new knowledge, which, in fact or by design, lead to the emergence of technologically new or improved

products or processes. Some may be completely innovative, others may not be new but necessary to implement.

Innovation is a complex process, and the scale of the activities required to bring about innovation in a firm can vary considerably. For example, the internal development of a radically different and complex electronic product for the mass market will involve many more steps than implementing an improved process resulting from the technology contained in a preprogrammed machine purchased for this purpose.

Innovative activities can be carried out within the firm or include the acquisition of goods, services or knowledge from external sources, including consulting services. Thus, a firm can acquire external technologies in an immaterial or materialized form.

Innovative activity is carried out in all sectors of the economy: manufacturing, services, government, healthcare and even private households. The concept of innovation is still not defined in some sectors of the economy, especially in those that are not market. also - "Types of innovation" - in the section - "Costs of innovation"

**A comment.** In the interpretation of the appendix to the project "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond", innovation activity is reduced to the reproduction of research and development (R&D) (in order to involve their results in civil law circulation for implementation in the form of an innovative product), as well as marketing actions, which is only part of the innovative activity. Also, in our opinion, it is rather controversial to refer to innovation activity as "management (emphasized by us - V.V.) the processes of technology commercialization" and "creation and development (highlighted by us - 8.V.) Innovation infrastructure", since these actions are only create external conditions for innovation. The definition given in the short terminological dictionary of the CISN is more correct. However, in our opinion, it also needs clarification. Therefore, innovative activity is a set of scientific, technological, organizational, financial and commercial activities aimed at creating and introducing a new or improved product on the market, creating a new or improved technological process used in practice, or a new or improved organizational and economic form, providing the necessary economic and (or) social benefit

#### **Types and types of innovations**

**Technological innovation** - activities related to both the development and implementation of innovations. In particular, in the industry, technologically new products and processes, as well as significant technological improvements

in products and processes; in service industries - technologically new or significantly improved services and new or significantly improved methods of production (transfer) of services.

**The types of activities that are not technological innovations** not directly related to the introduction of new or significantly improved services or methods of their production or transfer, namely:

- organizational and managerial changes, including the transition to advanced management methods, the introduction of significantly changed organizational structures, the implementation of new or significantly changed directions in the economic strategy of the enterprise;
- implementation of quality standards.

In industry, the following changes are not classified as technological innovations:

- aesthetic changes in products (in color, decor, etc.);
- minor technical or external changes

in the product, leaving its design unchanged, not having a sufficiently noticeable effect on the parameters, properties, cost of a particular product, as well as the materials and components included in it;

- expansion of the product range by entering

in the production of products that were not previously produced by this organization, but already well-known in the sales market for types of products (possibly non-core) in order to ensure the momentary demand and income of the organization. For example, the production by a machine-building plant in the summer of non-core products that are in seasonal demand - nails.

(Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

#### **Technological product and process (CCI) innovations**

covers implemented technologically new products and processes and significant technological improvements to products and processes. CCI innovation is accomplished if it is introduced on the market (product innovation) or used in the production process (process innovation). CCI innovations arise from a combination of scientific, technological, organizational, financial and commercial activities.

Innovation can be carried out within the framework of both the main and secondary production activities of the firm. Technological innovation can take place both in the production process and / or products of a firm, and in ancillary

activities carried out by its supply, commercial, accounting, computer or service departments. In practice, it will be very difficult to identify product innovation in ancillary services.

Technological innovation requires an objective improvement in the functionality of a product or the way it is delivered.

Other non-innovation product and process changes include:

- changes that are minor, unimportant, or not sufficiently novel;
  - changes that result in "other creative enhancements" in which novelty does not extend to the use of objective functional characteristics of products and their methods of production or delivery, but rather affects their aesthetic or other subjective properties;
  - the termination of the use of the process or the supply of the product to the market (the termination of an action is not a CCI innovation, although it can increase the efficiency of the firm);
  - simple replacement or expansion of capital;
  - changes caused solely by changes in factor prices;
  - production according to individual orders;
  - seasonal and other cyclical changes;
- product differentiation

**Product innovation** - development and implementation of technologically new and technologically advanced products. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

**Technological product innovation** Is the manufacture / commercialization of a product with improved performance characteristics in order to provide objectively new or improved services to the consumer. Technological product innovation can take two main forms:

- technologically new products, technologically improved products Technologically new product - a product whose technological characteristics (functional features, design, additional operations, as well as the composition of the materials and components used) or the intended use are fundamentally new or significantly differ from similar, previously produced products. Such innovations can be based on fundamentally new technologies, or on a combination of existing technologies in new use, or on the use of research and development results. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July

22, 2002 No. 156.)

**Technologically new product** - a product that significantly differs from previously manufactured products in terms of its technological characteristics or intended use. In innovations of this kind, radically new technologies can be used, they can be based on a combination of existing technologies in a new application, or obtained as a result of the use of new knowledge.

**Technologically advanced product** Is an existing product for which quality characteristics are improved, the economic efficiency of production is increased by using more highly efficient components or materials, partial changes in one or more technical subsystems (for complex products). (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the organization's innovative activities", approved by the decree of the State Statistics Committee of the Russian Federation No. 156 dated July 22, 2002.)

**Technologically advanced product** - an existing product whose performance has been significantly supplemented or updated. A simple product can be improved (in the direction of improving performance or reducing cost) through the use of more efficient components or materials; a complex product consisting of a number of integrated technical subsystems can be improved by making partial changes to one of the subsystems

**Process innovation** - development and implementation of technologically new or technologically significantly improved production methods, including methods of transferring products. Innovations of this kind can be based on the use of new production equipment, new methods of organizing the production process or their combination, as well as on the use of research and development results. Such innovations are usually aimed at improving the efficiency of production or transfer of products already existing at the enterprise, but can also be intended for the production and supply of technologically new or improved products that cannot be produced or supplied using conventional production methods.

**Service**is considered a technological innovation when its characteristics or methods of use are either fundamentally new or significantly (qualitatively) improved in technological terms. The use of significantly improved methods of production or transfer of services is also a technological innovation. The latter can cover changes in equipment or production organization associated with the production or transfer of new or significantly improved services that cannot be produced or transferred using existing production methods, or with an increase in the efficiency of production or transfer of existing services. Introduction of

new or significantly improved services, methods of their production (transfer) can be carried out on the basis of fundamentally new technologies or new combinations of existing technologies or on the basis of new knowledge. In this case, technologies can be embodied in new or improved machines, equipment, software, and new knowledge is the result of research, acquisition or use of special qualifications or skills. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.) acquisition or use of special qualifications or skills. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.) acquisition or use of special qualifications or skills. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

**Organizational innovation (organizational and management changes)** - a type of innovation that is not related to technological innovation and innovations carried out within their framework in the organization of production processes or marketing research related to the development and implementation of technological innovations. Organizational and managerial changes (organizational innovations) can occur in the following areas:

- development and implementation of a new or significantly changed corporate (shareholder) strategy in an organization (group of organizations);
  - the introduction of modern (based on information technologies) methods of managing an organization (meaning technologies using modern computer technology and special software for solving, for example, problems of accounting and warehouse accounting, personnel accounting and other types of resources, planning the needs of the organization, analyzing financial the state of the organization and support for making management decisions, automated document management systems of the organization, information and reference systems for accounting for customers, contractors, clients, etc.);
  - development and implementation of new or significantly changed organizational structures in the organization;
  - innovations in the use of shift working hours;
- application of modern quality control systems, certification of products (services), including use Technological process innovation- mastering technologically new or significantly improved production methods, including methods

of product delivery. These methods may include changes to equipment or manufacturing, or both; they can be the result of the use of new knowledge. Such methods are usually aimed at the production or supply of technologically new or improved products that cannot be produced or supplied using existing production methods, or at a significant increase in production, or at the efficiency of supply of existing products.

In some service industries, the distinction between process and product may not be clear. For example, a process change in the telecommunications industry aimed at introducing an intelligent grid makes it possible to market a series of new products such as call waiting or call display.

In service industries, technological process innovation includes improved capabilities embodied in organizations and day-to-day practices when the result is a tangible change in product output.

**Towards non-technological innovation** includes all types of innovation that are not related to technological innovation. This means that it includes all of the firm's innovative activities that do not relate to the introduction of technologically new or significantly improved products or services, or to the application of technologically new or significantly changed processes. The main types of non-technological innovation are organizational and managerial innovation. In its purest form, these innovations are excluded from technology innovation surveys. These types of innovations are included in innovation surveys only if they arise from a technology innovation project. Based on the experience of a 1994 Australian Bureau of Statistics survey,

- introduction of improved management technologies;
- presentation of significantly changed organizational structures;
- Introduction of new or significantly changed strategic corporate directions.

**Organizational innovation** in the firm includes:

- introduction of significantly changed organizational structures;
- implementation of progressive management methods;
- Implementation of new or significantly changed corporate strategy orientations.

#### **Measuring innovation activity**

**Innovative activity of the organization** evaluated by three main characteristics:

- the presence of completed innovations;
- the degree of participation of the organization in the development of these innovations;

- identifying the main reasons why innovation was not carried out.

(Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

For a certain period, the CCI **innovative activity of the company** can be of three types:

- **successful** in progress towards the implementation of a technologically new or improved product or process;
- **interrupted** prior to the implementation of a technologically new or improved product and process, due to the project encountering difficulties, the idea and know-how are sold or otherwise ceded to another company, or the market has changed;
- **ongoing**, that is, the work continues, but the result has not yet been achieved. Such activities may be conducted to lead to an intended new or improved product or process, or may have more vague goals, as in the case of basic or general technology research. new or significantly improved products introduced on the market, new or significantly improved services or methods of their production (transfer), also already introduced on the market, new or significantly improved production processes introduced into practice. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization",

*In domestic statistical practice, in fact, innovatively active organizations include organizations that had, in the reporting period (annual, not three-year) costs for innovations, regardless of their size, stage of the innovation process and the level of its completion.* (see: Economic description of the problem of electronic data processing in the form No. 4-innovation.)

An organization that has completed innovations in the last three years indicates the degree of participation of its own or third-party organizations in the development of these innovations (technologically new or significantly improved products, services or methods of their production (transfer), technologically new or significantly improved production methods, including transfer methods product). At the same time, in the current statistical observation, the following classification is applied (^ extent of participation: innovations were developed: mainly by other organizations; this organization together with other organizations; basically, this organization. (Instructions for filling out the form of federal state statistical observation No. 4-innovation " Information about the

innovative activity of the organization ", approved by the decree of the State Statistics Committee of Russia from 22.07.

Under the development of innovations, mainly by other (third-party) organizations, we mean the implementation for a given organization under a contract of research and development by scientific organizations, universities, etc., with the possible minimum participation of this organization, which is limited mainly by the adaptation of developments to specific conditions, or the acquisition of new technologies (technical advances) through technological exchange (patent and non-patent licenses). The development of innovation by an organization in conjunction with other organizations involves the implementation of the innovation process, to a large extent, both by the organization itself and by third-party collaborators.

In the development of innovations, mainly by the organization itself, minimal participation, mainly of a consultative nature, of individual organizations and individuals is possible. The reasons for the lack of innovation in the organization over the past three years may be:

- no need for innovation due to earlier innovations;
- lack of market demand;
- other factors hindering innovation.

(Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

**CCI innovative firm**Is a firm that has introduced technologically new or significantly improved products, processes, or combinations of products and processes during the reporting period. It is a firm with successful innovation activities during this period. Within this category, it is interesting to single out firms that have only "passive" CCI innovations, that is, those that innovate exclusively through borrowed technology used in new machines and equipment. In addition, it is recommended to include in the category of innovative firms only those firms founded during the reporting period that, at their founding, introduced a CCI innovation new to their current market, or introduced a CCI innovation later in the reporting period.

A firm that interrupted the CCI innovation activity is not included in the number of innovative ones, as well as a firm that, at the end of the period under review, continues the innovative work begun by the CCI, which has not yet been completed. An innovative firm has many characteristics that can be grouped into two main skill categories:

• **strategic skills:** long term vision; the ability to detect and even anticipate market trends; willingness and ability to collect, process and assimilate technological and economic information;

• **organization skills:** taste for risk and the ability to take risks; internal cooperation between different functional units and external cooperation with researchers, consultants, customers and suppliers; engaging the entire firm in the change process and investing in human resources.

(Green Paper of the European Commission - European Commission (1996), Green Paper on Innovation, Bulletin of the European Union, Supplement 5/95, Luxembourg.)

In theory, all firms that have emerged and during the period under review have implemented new products or processes. In practice, it is recommended that the number of CCIs of innovative firms include:

- firms that already existed at the beginning of the period under review and implemented during this period products or processes that are technologically new (or improved) for the given firm:
- firms that emerged during the period under review and:
  - at their founding carried out products or processes that are technologically new (or improved) for the functioning market of the firm;
  - after their founding, they have already carried out during this period products or processes that are technologically new (or improved) for the given company.

**Definition of Chamber of Commerce and Industry of Innovative Companies** From a policy perspective, innovation performance indicators are perhaps the most important innovation survey results. But they are also the most problematic. The simplest indicator is the number of innovative firms. This indicator is obtained by recalculating the number of firms that have carried out effective CCI innovation activities over the past three years. This includes firms that were active at the beginning of the period and which, during the reporting period, introduced CCI innovations that are new (or improved) for them, and firms that began their activities during this period and introduced TYPE innovations that became new (or improved) for the market. these firms, or firms that, after their formation, introduced CCI innovations that are new (or improved) for them. Firms,

*At the same time, in order to obtain complete data on the total costs of innovation, it is recommended to keep a separate record of firms involved in innovation activities, but not innovating (either due to the closure of an innovation project, or as a result of an increase in the duration of the project).* The

characteristics of this group of firms may differ from those of non-innovative firms.

**A comment...** There is a certain contradiction in the practice of domestic statistics of innovations. On the one hand, organizations that have implemented (completed) innovations in the last three years are declared to be innovatively active organizations, and on the other hand, all organizations that have shown the presence of costs for innovations in the reporting period are classified as innovatively active organizations. In our opinion, it is advisable to determine the innovativeness of organizations using two indicators: 1) innovative organizations - organizations that have implemented (completed) innovations in the last three years, and 2) innovatively active organizations - organizations that carried out in the reporting period (three years, a year) innovative activity, regardless of the degree of its completion (the criterion for referring to this type of organization is the presence of innovation costs in the reporting period). Also, it should be borne in mind that the reporting period in the Fractal Manual is three years. Therefore, for international comparability, the indicators characterizing innovative organizations should cover a three-year period of the organization's activity (and not mainly a year, as now the containment or premature completion of specific innovative projects. These factors are classified as follows. Economic factors:

- lack of own funds,
- lack of financial support from the state,
- low effective demand for new products,
- high cost of innovations,
- high economic risk,
- long payback periods of innovations, production factors:
- low innovation potential of the organization,
- lack of qualified personnel,
- lack of information about new technologies,
- lack of information about sales markets,
- insensitivity of organizations to innovations,
- lack of opportunities for cooperation with other enterprises and scientific organizations.

Other factors:

- low demand from consumers for innovative products (services),
- insufficient legislative and regulatory
- documents regulating and stimulating innovation,
- uncertainty of the timing of the innovation process,

- underdevelopment of the innovation infrastructure (intermediary information, legal, banking, other services),
- underdevelopment of the technology market.

The listed factors hindering innovation, slowing down the innovation processes in the organization (over the past three years) are assessed depending on the importance for the organization of one reason or another: insignificant or insignificant; significant; main or decisive. Also very important is information on the number of innovative projects for which these factors served as a real obstacle to their implementation over the past three years. Shows the number of innovative projects that were in connection with this:

- seriously detained;
- were started, but stopped at some intermediate stage (stopped);
- have not even been started.

(Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

#### **Constraints to innovation**

Due to the action of factors hindering the development of innovation, innovation activity may not start or lead to the expected results. The list is subject to change according to national requirements.

#### **Constraints to innovation:**

Economic forces:

- excessive risk;
- too high costs;
- insufficient funding;
- too long an innovation payback period.

Internal factors:

- insufficiently high innovation potential (R&D, industrial designs, etc.);
- lack of qualified personnel;
- insufficient technological information;
- insufficient market information;
- the difficulty of controlling the cost of innovation;
- lack of in-house flexibility;
- unavailability of third-party services;
- lack of opportunities for cooperation.

Other factors:

- lack of technological capabilities;

- infrastructure deficiencies;
- lack of need for innovation (use of existing ones);
- insecurity of property rights;
- legislation, norms and standards, taxation;
- consumers immune to new types of products and new processes

**Joint projects for the implementation of research and development,  
other types of innovative activities**

One of the tasks of statistical observation of innovations is to determine the presence of cooperation ties, cooperation of an organization that carries out innovative activities in the field of research and development, and other types of it with other organizations for the reporting year, regardless of whether the organization acts as a customer or executor of relevant works and services.

Data is collected on the number of joint research and development projects, including those on state scientific and technical, federal targeted and international programs that stimulate research and innovation. At the same time, joint projects are distributed in accordance with **the location of cooperation partners**: Russia; the countries of the CIS and Eastern Europe; countries - members of the European Union; USA and Canada; Japan; other countries. Joint projects are also categorized by types of partners:

- enterprises as part of a group (association, partnership, society), which includes the organization;
- consumers of products (works, services);
- suppliers of equipment, materials, components, software;
- competitors in the industry;
- consulting, information firms;
- scientific organizations;
- universities or other higher education institutions.

It is accepted to evaluate the level of activity of participation in joint research projects of cooperation partners on the following scale:

- there is no cooperation;
- low level of cooperation;
- high level of cooperation.

(Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

Oslo Guide recommends that innovation surveys include scientific and technical cooperation with partners and a group of countries. **Product life cycle**-the period during which the production of this product was carried out until the moment of its replacement, that is, before the start of the release of a new or significantly modified product (both innovative and non-innovative). The life cycle is indicated in full years. For example, if the product was produced for two years and three months, then three years are indicated, and if the product was produced for five or seven months, then one year is indicated. If the products have not undergone changes or modifications, the total duration from the beginning of its release to the reporting period is indicated. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

**Innovation cycle**- a periodically repeating process of sequential creation of innovative products - from identifying a new need and generating an idea (concept) to its practical implementation (implementation) and marketing in the market within a single economic entity or within a set of organizations united by stable economic ties, and constantly reproducing innovative infrastructure. (Appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond.")

**Life cycle of innovation**- the period of time until commercialization or the expected payback period. The sales figures for technologically new and technologically advanced types of products are directly influenced by the life cycle of the product. They tend to be higher for short lifecycle product groups where innovation occurs most frequently. Innovations of this kind are not always the most significant or technologically advanced. A high proportion of sales of technologically new or significantly changed products does not necessarily indicate a high level of innovation. To account for the impact of the product life cycle on this indicator, companies must provide data on the average life cycle of their products. This data can be used to weight percentages.

**A comment.**The definition of the innovation cycle in the appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond" needs to be improved, since it is highly doubtful to attribute the process of constant reproduction of the innovation infrastructure to the innovation cycle. Besides, is the concept of "innovation cycle" necessary at all? In the interpretation of the

appendix to the project "Fundamentals ...", this definition essentially refers to innovation at the organizational level

**Total costs (current and capital)**for technological innovation includes the costs of the development and implementation of technologically new or significantly improved products, services or methods of their production (transfer), technologically new or significantly improved production methods), both performed by the organization's own resources, and the cost of payment for work, services of third parties ... (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

**Total costs** at the CCI, innovation activities include current and capital costs incurred in the course of innovation.

It is recommended that data be collected according to the classification of the total costs of CCI innovation by type of innovation activity and by type of cost (current costs of innovation or costs of innovation related to fixed assets). Information on the cost of CCI innovation by source of funds is also very important, as financial issues arise very often in policymaking.

#### **Classification by type of cost**

The costs of CCI innovative activities should be, if possible, broken down into current and capital. This is especially important if the data needs to be compared with data on investments in intangible assets (intangible assets), with which the cost of innovation is sometimes confused. **Current expenses**, carried out mainly at the expense of the cost of products (works, services), include the costs of remuneration of workers involved in the development and implementation of technological innovations, social contributions, as well as other costs not related to capital costs, such as costs for the purchase of raw materials, materials, equipment, etc., necessary to ensure innovative activities carried out by the organization during the year. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

**Current innovation costs** consist of labor and other operating costs.

**Labor costs** include annual salary payments and all other payments, for example, bonuses, payment of severance pay, contributions to the pension fund and other social benefits, payroll taxes, etc. Labor costs for personnel not involved in the CCI innovation activity (protection , technical staff) should be excluded from this article and treated with other recurring costs.

**Other operating costs** include non-capital purchases of materials, services and equipment for the implementation of the Chamber of Commerce and Industry of the company's innovative activities for the reporting year.

**Capital investments (long-term investments)** represent the annual costs of creating, increasing the size, as well as the acquisition of non-current assets of durable use (over one year), not intended for sale, carried out in connection with the development and implementation of technological innovations. They consist of the costs of acquiring structures, land plots, natural resources, machinery, equipment, and other fixed assets required for innovation. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

**Capital expenditure on innovation-** the annual gross costs of fixed assets used for the TYPE of the company's innovative activities. They should be fully reflected in the period in which they were incurred and should not be depreciated. This includes the costs of land and buildings, tools and equipment and, according to the revised System of National Accounts (SNA), computer software, which are part of the NML costs and are considered a capital investment. The Land and Buildings item includes the acquisition of land and buildings for CCI innovation activities, including major improvements, modifications and renovations.

Article "Tools and Equipment" includes basic tools and equipment purchased for use in the firm's technological innovation activities. The article "Computer software", according to the modified SNA, includes software, program descriptions and accompanying materials for use in the TYPE of the firm's innovation activities. The costs of CCI innovations include investments and tangible assets: capital expenditures for R&D, the acquisition of new machinery and equipment related to technological innovations

**Types of innovation:**

- research and development of new products, services and methods of their production (transfer), new production processes;
- purchase of machinery and equipment related to technological innovation;
- acquisition of new technologies,  
of which the rights to patents, licenses to use inventions, industrial designs, utility models;
- purchase of software;
- production design, other types of production preparation for the release of new products, the introduction of new services or methods of their production

(transfer);

- education and training of personnel related to innovation;
- marketing research;
- other costs of technological innovation.

(Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

The following list **types of innovation** is not exhaustive. Its purpose is to explain when certain activities should be included in a CCI innovation.

*Acquisition and formation of relevant knowledge, new to the company:*

- research and experimental development;
- acquisition of non-material technologies and know-how;
- acquisition of materialized technologies.

*Other forms of preparation for production:*

- instrumental preparation and organization of production;
- production design;
- other capital acquisitions;
- start-up of production.

*Marketing of new or improved products.*

Of all the above types of work, only R&D and the acquisition of machines containing new technologies are, by definition, CCI an innovative activity. Others may be so, depending on the goals of their implementation.*Design:*

- production;
- artistic.

**Personnel training** is a type of CCI of innovation activity when it is necessary for the implementation of a technologically new or improved product or process.

**Marketing** is a type of CCI of innovation activity when it is necessary for the implementation of a technologically new or improved product (or, less often, a new process).

**Software** - development, acquisition, adaptation and use of software are part of the Chamber of Commerce and Industry of Innovation.

**Classification by type of innovation**

The description of cost items that should be included under different categories in the cost of technological innovation is based on the definitions of the types of CCI of innovation activity.

The following classification should be considered as a general guideline for industry and services. For the service sector, not all elements are necessary, so they should be excluded.

To facilitate comparison with R&D costs **It is recommended to collect information on the classification by the type of CCI innovation activity by the total cost of CCI innovation (current and capital costs). The following classification can be used:**

- R&D costs;
- the cost of acquiring technologies that are not embodied in a specific product and know-how;
- the cost of acquiring technologies embodied in a specific product;
- costs of equipping with equipment, industrial engineering, industrial design, production start-up, including other items of costs for pilot plants and prototypes not included in the R&D;
- the cost of conducting trainings related to the Chamber of Commerce and Industry of Innovation;
- marketing costs of technologically new or improved products

**By funding sources** the costs of technological innovation are distributed:

- own funds of the organization, including from profit, at the expense of the cost of products (works, services);
- funds, respectively, of the federal budget and the budgets of the subjects of the federation and local budgets received by the organization directly or under contracts with the customer;
- off-budget funds (fund for stabilizing the economy, fund for regional development, sectoral and inter-sectoral off-budget funds for research and development work, Russian fund for technological development, conversion fund, road fund, etc.);
- foreign investment;
- other sources.

(Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by decree Goskomstat of Russia No. 156 dated 22.07.2002.)

#### **Funding source classification**

It is very important to know about how innovations are financed by CCIs. This can be important for assessing the role of public policy and internationalization in the innovation process. The following classification is proposed according to the source of funding:

- own funds;

- funds from affiliated companies (subsidiaries or associates);
- funds from other organizations;
- public funds (loans, grants, etc.);
- funds from supranational and international organizations (for example, the EU);
- other sources

**Goals and performance of innovation** Questions on the goals of innovation organizations are not provided for in the toolkit of the current national federal state statistical observation. A certain idea of the possible goals of an organization's innovation activity can be drawn from the assessment of the degree of influence of the results of innovation activity on its development (see "Results of innovation activity".)

#### **Innovation goals**

The innovative focus of a firm must be consistent with its economic goals (manufactured products and market sector) and the importance of goals that can be achieved in the course of the innovation process. This applies to all innovative activities of the firm. There are usually several goals.

#### **Economic goals of innovation:**

- substitution of types of products removed from production;
- expansion of the range:
  - the main type of product;
  - other types of products;
- development of products that are safe for the environment;
- maintaining market share;
- increasing market share;
- entering new markets:
  - foreign;
  - new local target groups;
- increased production flexibility;
- reduction of production costs due to:
  - reducing labor costs;
  - reducing material consumption;
  - reducing the energy intensity of production;
  - reducing the level of marriage;
  - reducing the cost of product design;
  - reducing the time needed to develop new products;
- improving product quality;
- improving working conditions;

- reduction of harm to the environment

**Results of innovation activity:**

- replacement of obsolete products (services) removed from production;
- improving the quality of products, services;
- expanding the range of products, types of services;
- preservation and expansion of traditional sales markets;
- creation of new sales markets in Russia and other countries;
- ensuring compliance with modern rules and standards;
- increasing the flexibility of production and the internal commercial process;
- growth in production capacity;
- reduction of wages, material costs, energy costs;
- reduction of environmental pollution;
- improvement of working conditions.

The listed main results of innovative activities carried out in the organization over the past three years are assessed according to the degree of their influence on the development of the organization:

- there was no impact;
- low impact;
- medium impact;
- high degree of impact.

(Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

In domestic statistics, innovative products (services) are understood as products (services) that have been subject to varying degrees of technological change over the past three years (as a result of product and process innovations). In domestic practice, the total volume of shipped innovative products consists of the following volumes:

- products that have been reintroduced or have undergone significant technological changes over the past three years;
- products that have been improved over the past three years;
- other innovative products.

For shipped products, newly introduced (fundamentally new) or undergoing significant technological changes (over the past three years), the scope (use), performance characteristics, features, design, as well as the composition of the materials and components used are new or significantly different in comparison

with previously produced (in the world) products. The definition of this product corresponds to the concept of technologically new products in the composition of product innovations presented above.

Such products, as a rule, are based on fundamentally new technologies or on a combination of new ones with the use of existing technologies. Microprocessors and VCRs are examples of radical innovations (fundamentally new). The first portable cassette player to combine the existing principles of tape recorders and miniature in-ear loudspeakers was an innovation of the second type. In both cases, no finished product has been produced before. Shipped products that have been improved (over the past three years) include products that already exist (in the country, in the world), the parameters of which have been significantly improved or modified. The definition of this product corresponds to the concept of improved products as part of product innovations,

This definition suggests two options. A simple product can be improved (in terms of improving its quality, increasing the economic efficiency of production) by using higher-quality components or materials or improved technological processes (changes in the technological equipment or organization of the technological process). A complex product, consisting of a number of integrated technical subsystems, can be improved by making partial changes to one of these subsystems.

*Other innovative products* (shipped) is based on the introduction of new or significantly improved production methods, involving the use of new production equipment, new methods of organizing production, or a combination of these. As a rule, this applies to products already produced in the organization. The definition of this product is consistent with the concept of process innovation presented above. In addition, products based on borrowed best practices (non-patent licenses, know-how, etc.) fall into this category. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156).

**Scope of innovative services**- the volume of technologically new or improved services that have undergone various kinds of technological changes over the past three years refers to services whose characteristics or methods of use are fundamentally new or significantly improved qualitatively or technologically. The scope of services of an innovative nature also includes services whose methods of production or transfer are new or significantly improved (meaning changes in equipment or organization of production that are necessary both for the production or transfer of new or significantly improved services,

and in order to increase the efficiency of production or transfer already existing services (works)). This is in line with the concept of technological innovation in the service sector formulated above.

### **Innovation results**

Defining what constitutes an innovation raises many terminological difficulties. Most products, and of course the processes that create them, are complex systems. Changes, therefore, must be identified in relation to:

- properties and characteristics of the effectiveness of the product as a whole;
- changes in the components of the product that increase its effectiveness, including the nature of the services it provides. Subsystem changes of this kind can be very small in scale, but their cumulative impact can be significant and important from an analytical perspective.

### **Impact of innovation on the performance of organizations**

Various indicators can be used to assess the impact of innovation on the performance of companies. For example:

- the share of sales attributable to new or improved types of products;
- the result of innovation;
- the impact of innovation on the use of factors of production.

### **Proportion of sales attributable to new or improved products**

When collecting data on this indicator, firms that started operations during the reporting period should be accounted for separately, since all of their sales are for new products. For these companies, only those products are considered that are new to their market sector. Firms that have emerged as a result of mergers, divestitures and other types of reorganization should not be considered as re-emerging if similar activities were carried out in the past.

#### **It is recommended to consider the percentage of sales attributable to:**

- technologically new types of products commercialized over the past three years;
- technologically advanced products commercialized in the past three years;
- types of products that are not technologically modified or subject only to product differentiation, produced using improved production methods over the past three years;
- types of products that have not been technologically changed or are subject only to product differentiation, produced using unchanged production methods over the past three years.

Sales of technologically new and technologically advanced products can be further subdivided into:

- sales attributable to product types that are new or technologically advanced for a given market segment;
- sales attributable to types of products that are new or technologically improved only for this firm.

#### **Innovation results**

To provide a complete picture of the impact of innovation on the efficiency of the companies must be obtained general information about the company at the beginning and end of the three-year period:

- sales (year t and t - 2);
- export (year t and t - 2);
- personnel (year t and t - 2);
- current profit (year t and t - 2).

#### **Impact of CCI innovations on the use of production factors**

One of the results of innovation, especially in manufacturing industries, is a change in the production function, that is, a change in the use of factors of production.

It is proposed to include in the survey how CCI innovations have influenced the use of factors of production, such as the use of human labor, the consumption of materials and energy, and the use of fixed capital.

This information can be obtained by simply asking firms whether there have been any changes in the use of factors of production as a result of the introduction of CCI innovations. It is also possible to quantify these changes, at least roughly.

This indicator provides a rough idea of the impact of CCI innovation. It can refer to innovations introduced over the past three years, or it can provide a broader view of the impact of innovation on a firm's performance.

#### *Average cost savings for process innovation*

They provide an assessment of the significance of various sources of information used by the organization to form its own innovation policy, prepare solutions related to the development and implementation of innovations. Sources of information for innovation can be classified as follows:

- Internal sources of the organization:
- research units;
- production units;

- marketing divisions;
- other.
- Organizations as part of a group (association, partnership, society), which includes the organization.
  - Suppliers of equipment, materials, components, software.
  - Industry competitors.
  - Consumers of products (works, services).
  - Consulting, information firms.
  - Scientific organizations:
    - academic profile;
    - industry profile.
  - Universities or other higher education institutions.
  - Modern rules, standards.
  - Description of inventions, patents, official publications of the patent service, etc.
    - Conferences, seminars, symposia.
    - Scientific and technical literature.
    - Exhibitions, fairs, other advertising media.

The listed sources of information are assessed depending on the importance of a particular source for the organization:

- not used;
- insignificant or insignificant;
- significant;
- main or decisive.

Internal sources of the organization may include: its top management (directorate), research, production, marketing departments of the organization, its own highly qualified specialists, etc. The sources of information also include cooperation with users of the organization's products, cooperation with subcontractors (suppliers of materials, equipment, components), cooperation with consulting and information services, cooperation with other organizations, government contracts, innovation support programs, cooperation with scientific organizations, information on the activities of competitors, scientific or technical literature, patents. (Instructions for filling out the federal state statistical observation form No.4-innovation "Information about the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

#### **Sources of information on innovation (drivers of innovation)**

The list is subject to change according to national requirements. Internal sources of the firm or business group:

- own R&D;
- marketing;
- production;
- other internal sources.

External market / commercial sources:

- competitors;
- the acquisition of technologies embodied in any product or process;
- acquiring technologies that are not embodied in any product or process;
- customers or consumers;
- consulting firms;
- suppliers of equipment, materials, components and software.

Educational / research institutions:

- higher educational institutions;
- government research institutes;
- private research organizations.

Publicly available information:

- disclosure of the essence of patented inventions;
- professional conferences, meetings and magazines;
- fairs and exhibitions.

Some of the listed sources can be divided into local and foreign sources.

The exchange of technologies for the purposes of statistical observation means the transfer (acquisition) of scientific and technical knowledge, experience and information for the purpose of applying technological processes, producing products and providing scientific and technical and related services to the exchange on commercial terms determined by an agreement (agreement, contract) concluded between a resident and a non-resident of the Russian Federation.

For information **about export and import** technologies within the framework of the current statistical observation according to the form No. 1-license "Information on the commercial exchange of technologies with foreign countries (partners)" information is collected on payments (receipts) under agreements (agreements, contracts) for intangible transactions (intangible assets) related to exchange (trade) of knowledge, information and services of a technical nature that meet the following conditions:

- international orientation of the transaction (a transaction between a resident and a non-resident);

- the commercial nature of the transaction (availability of payments / receipts);
- the object of the agreement should be technology, the provision of technical services and related services.

Data on the export and import of technologies and services of a technical nature are recorded under the categories of commercial transactions. This takes into account all commercial transactions, respectively, for the export and import of technologies and services of a technical nature, concluded between **resident and non-resident**... Commercial transactions on the exchange of technologies can be formalized both in the form of separate agreements and in the form of a package of agreements. The package includes several categories of commercial agreements within the framework of an agreement (contract) or a set of agreements.

**Categories of commercial agreements** on technology exchange covers agreements including:

- 1) patent for invention;
- 2) non-patent invention;
- 3) patent license;
- 4) know-how;
- 5) trademark;
- 6) industrial model;
- 7) engineering services;

8) research and development (for export - research carried out by Russian specialists abroad and financed from foreign sources (export of technologies); for import - research carried out in Russia by foreign specialists and financed from Russian sources (import of technology));

- 9) others.

Information to be collected and recorded **on the area of destination and cost characteristics of the object of the agreement, the duration of the agreement, partner countries by agreement...** (Instructions for filling out the federal state statistical observation form No. 1-license "Information on the commercial exchange of technologies with foreign countries (partners).")

**Acquisition and transfer by the organization of new technologies (technical achievements), software**

In this case, the total number of acquired and transferred by the organization is determined new technologies (technical achievements), software during the reporting year, including acquired and transferred technologies outside the Russian Federation.

The number of acquired (transferred) technologies is distributed according to the forms of acquisition (transfer):

- rights to patents, licenses to use inventions, industrial designs, utility models:
  - research and development results;
  - know-how, technology transfer agreements;
  - purchase (sale) equipment;
  - purposeful hiring (transition) to work of qualified specialists;
  - other.

(Instructions for filling out the form Federal State Statistical Surveillance No. 4-innovation "Information on the innovative activity of the organization", approved by the decree of the State Statistics Committee of Russia dated July 22, 2002 No. 156.)

**Diffusion of innovation** is defined as a way of promoting innovation through market and non-market channels from the moment of its first application elsewhere and in other countries and regions, in other industries, in other markets and in other companies.

#### **Technology Acquisition / Distribution Questions**

Questions on the balance of payments by technology are included in innovation surveys in two versions. On the most ambitious approach, questions are asked about the costs and benefits of patents, licenses, know-how, technical support, and other technology diffusion. According to the second approach, the collection of information about finances is not necessary, there is enough data on whether the firm acquired or sold technology in the domestic or foreign markets.

This methodology is described in the OECD TWR Handbook. But the possibility of collecting detailed information on TBR in innovation surveys is questionable. This may require a separate survey. The second approach is more suitable for innovative surveys.

To gain an understanding of the relationship between technology acquisition, innovation and technology sale it is recommended to include in innovation surveys the question of whether a company acquired or sold technology in the domestic or foreign markets (if possible, indicating a specific region). Further, the information should be detailed by the type of transaction (patents, non-patented inventions, licenses, know-how, trade marks, provision of technological services, consulting services, acquisition / transfer of technologies through the purchase / sale of an organization or equipment, mobility of qualifi-

fied personnel, etc.). ) Patenting and other methods of protecting inventions, scientific and technical developments of the organization

It is accepted to assess the importance of various methods of protecting inventions, scientific and technical developments related to innovations developed by the organization and used over the past three years. Moreover, the following protection methods are used:

- patenting inventions, industrial designs, utility models;
- registration of a trademark;
- copyright protection;
- ensuring trade secrets, secrecy, know-how;
- the complexity of product design;
- providing an advantage in terms of development and release
- products over competitors.

The listed methods of protecting inventions, scientific and technical achievements for product and process innovations are evaluated depending on their significance:

- not used;
- negligible or insignificant;
- significant;
- main or decisive.

One of the indicators related to innovation activity is the number of applications for patents for inventions, patents for industrial designs, certificates for utility models filed by the organization (by the author - an employee of the organization or by the employer or their successor), official registration of computer programs, databases, topologies of integrated circuits. (Instructions for filling out the federal state statistical observation form No. 4-innovation "Information on the innovative activity of the organization", approved by the State Statistics Committee of Russia dated 22.07.2 (102 No. 156).

#### **Questions on patents and applicability of innovations**

Patent data (patent applications and granted patents) are not indicators of innovation performance. They are indicators of inventive activity that does not always lead to innovation. But for a deeper understanding of the essence of innovation processes, questions on patenting are needed. The most common, of course, are questions about the number of patent applications filed by a firm and the number of patent certificates obtained (these data are available in various national and international databases). Questions on patenting were included and some surveys on innovation or R&D.

The respondent firms can be asked to rate the effectiveness of various methods of maintaining and increasing the competitiveness of innovations presented over the past three years. These methods may include:

- patenting;
- registration of an industrial design;
- secrecy;
- the complexity of the industrial image;
- advantage over competitors in terms of development time

**General (external to organizations) conditions for innovation**

**Innovation policy** Of the Russian Federation, an integral part of state policy is a type of activity at the federal, regional and municipal levels for the direct and indirect regulation of the implementation of the basic guidelines of the state in relation to the status, principles, goals, objectives, priorities, resources, mechanisms and results of innovation. (Appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond.") -

**State innovation policy**- determination by the state authorities of the Russian Federation and state authorities of the constituent entities of the Russian Federation of the goals of the innovation strategy and support mechanisms for priority programs and projects. (The concept of the innovation policy of the Russian Federation for 1998-2000, approved by the decree of the Government of the Russian Federation of July 24, 1998, No. 832.)

**State innovation policy**- part of the state socio-economic policy aimed at improving state regulation, developing and stimulating innovation. (Federal Law "On innovation activity and state innovation policy" adopted by the State Duma on December 1, 1999, approved by the Federation Council on December 23, 1999 and rejected by the President of the Russian Federation on January 3, 2000).

**Policy of the Russian Federation in the field of development of the national innovation system** is a part of state policy and is focused on the formation of a new economy of the country based on knowledge, developing competitive science-intensive production based on the achievements of science, technology and technology. This policy is carried out taking into account the whole range of reforms that create a macroeconomic environment favorable for innovation activity and encourage entrepreneurial initiative. (The draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period until 2010 and beyond" (prepared by the interdepartmental working group of the Security Council of the Russian Federation on problematic

issues of the formation of the national innovation system of the Russian Federation using materials submitted by federal executive bodies subjects of the Russian Federation, academies of sciences with state status, and organizations of the scientific and technical complex) - order of 12.01.2004 No. MP-pr-82, p. 2.)

**Innovation policy** only recently emerged as a fusion of scientific, technical and industrial policy. Non-emergence signals a growing recognition that knowledge in all its forms plays a critical role in economic progress, that innovation is at the heart of this “knowledge-based economy,” and that innovation is more complex and systemic than previously thought. Systems approaches to innovation shift the focus of politics towards interaction between institutions, shifting attention to the processes of interaction both in the creation of knowledge and its dissemination and application. The term “national innovation system” was specifically coined for this complex of institutions and knowledge flows.

There are three main categories **factors** primarily related to innovation. They relate to businesses, scientific and technical institutions and the transfer and absorption of technology, knowledge and skills. In addition, the range of opportunities for innovation is influenced by a fourth set of factors, such as the environment of institutions, regulation, macroeconomic environment, and other conditions that exist independently of any aspect of innovation.

These four large categories (areas of) innovation factors can be presented as a map showing areas where policy leverage could be applied to commercial innovation or areas to be taken into account when formulating policy initiatives. In this way, the policy area for the national innovation system can be summarized. While the focus of the literature has been on national systems, it is clear that in many cases this approach is applicable at the local and transnational levels as well.

Schematically, these four main areas **areas of innovation policy** are characterized as follows:

- more *broad framework conditions* national institutional and structural factors (eg legal, economic, financial, educational) determine the rules and range of opportunities for innovation;
- *scientific and technical basis* - accumulated knowledge and scientific and technical institutions that enable commercial innovation by providing technology training and scientific knowledge;
- *transmission factors* - these are the factors that strongly influence on the effectiveness of connections, flows of information and skills

and successful learning, essential to commercial innovation; these are factors or people whose nature is largely determined by the social and cultural characteristics of the population;

- *innovative dynamo* - the most central the area for commercial innovation encompasses dynamic factors within a firm or in its immediate environment that most directly affect its innovativeness

**A comment.** The main remark to the definition set forth in the appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond" is that innovation policy should include not only regulation of the implementation of state directives, but also, being part of government policy, to shape these attitudes. As for the definition given in the Concept of the Innovation Policy of the Russian Federation for 1998-2000, the mechanism for implementing the goals of innovation policy, in our opinion, should apply not only to priority programs and projects, but also to form a favorable environment for all types of innovation.

**National innovation system (NIS)**- a developing set of interacting institutions of management and regulation of innovation activity, economic entities of the state and non-state sectors of the economy, organizations of the educational and financial-credit spheres, carrying out innovative activities on the basis of effectively operating institutional mechanisms. (Appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond.")

***The national innovation system is a unity:***

- an innovative complex - organizations and teams directly involved in the creation and development of innovations, as well as the necessary research and production infrastructure;
- forms and results of innovation;
- subjects of management, regulation and promotion of innovation - a set of authorities, institutions, centers of technological forecasting, state structures and non-state institutions of the innovation sphere.

(Appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond.")

**National innovation system**Is a developing set of interacting subjects of the state and non-state sectors of the economy, carrying out innovative activities on the basis of the formed economic and institutional mechanisms. The national innovation system unites the efforts of the state, organizations of scientific, technical and educational spheres, the entrepreneurial sector of the economy, the

financial and credit sphere, state structures and non-state institutions of the innovation sphere in the interests of accelerated implementation of the results of intellectual activity in the market of high-tech science-intensive products based on the formation between the subjects of innovative activity equal partnership. represented by federal executive bodies, constituent entities of the Russian Federation, academies of sciences with state status, and organizations of the scientific and technical complex) - order of 12.01.2004 No. MP-pr-82, p. 3.) represented by federal executive bodies, constituent entities of the Russian Federation, academies of sciences with state status, and organizations of the scientific and technical complex) - order of 12.01.2004 No. MP-pr-82, p. 3.)

At a higher level - with a systematic vision of innovation - the importance of transferring and disseminating ideas, skills, knowledge, information and signals of many kinds. The channels and networks through which this information circulates are socially, politically and culturally rooted and highly dependent on and constrained by institutional frameworks. The National Innovation System (NIS) approach views innovative firms in the context of external institutions, public policies, competitors, suppliers, consumers, value systems, and social and cultural practices that affect their performance.

**A comment.** In our opinion, more correct is the definition proposed in the draft "Fundamentals of the policy of the Russian Federation in the field of development national innovation system for the period up to 2010 and beyond "

**Innovative infrastructure** (infrastructure of the nationalinnovation system) - a set of conditions (fundamental science, education system), organizations, industrial and other public facilities that provide opportunities for successful innovation. (Appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond.")

**Innovative infrastructure** Is a collection of objectsinnovative activities and interrelationships between them, which produce new knowledge and innovations, transform them into new products and services, ensure their distribution and consumption in market conditions. The innovation infrastructure is the link between the results of scientific research and the market, the state and the business sector of the economy. The infrastructure of the national innovation system is based on technology transfer centers, innovation and technology centers, technoparks and high-tech territories, funds for supporting research and development work, funds for start-up and venture funding, centers for training specialized personnel (personnel) and information support for innovation activities, etc.

**Innovative infrastructure** - organizations promoting implementation of innovative activities (innovation and technology centers, technology incubators, technology parks, educational and business centers and other specialized organizations. (Concept of the innovation policy of the Russian Federation for 1998-2000, approved by the Government of the Russian Federation of July 24, 1998 No. 832.)

**Innovative infrastructure** - a set of organizations, providing services for the creation, development in production and (or) practical application of new or improved products, new or improved technological process. (Federal Law "On Innovation Activity and on State Innovation Policy" adopted by the State Duma on December 1, 1999, approved by the Federation Council on December 23, 1999 and rejected by the President of the Russian Federation on January 3, 2000)

**A comment.** A more correct definition given in the draft "Fundamentals of the policy of the Russian Federation in the development of national innovation system for the period up to 2010 and beyond ". Although, in our opinion, objects producing new knowledge and innovations should not be included in the innovation infrastructure

**Innovative program** (innovative project) - interstate, federal, interregional, regional, sectoral levels - justified by the interests of the market a set of activities, coordinated in terms of resources, performers and timing of their implementation, ensuring the effective development, creation and development of an innovative product. (Appendix to the draft "Fundamentals of the policy of the Russian Federation in the development of the national innovation system for the period up to 2010 and beyond. ")

**SOCIO-ECONOMIC MECHANISM OF REGULATING DIFFER-  
ENTIATION OF CONSUMPTION  
FOOD: DEVELOPING THE INSTITUTIONAL ENVIRONMENT<sup>2</sup>**

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*E.G. Reshetnikov,  
Doctor of Economics, IAGP RAS  
E-mail: eqro@yandex.ru*

*Differentiation of food consumption is one of the most important types of socio-economic differentiation of the population. It most clearly indicates the existence of problems in the social sphere, is a factor in increasing social tension in society, signals a decrease in the country's food security. It also has a clearly pronounced economic aspect associated with a decrease in the economic availability of food for a significant part of the population, and, consequently, with a decrease in the volume of effective demand, which reduces the interest of producers in expanding their activities.*

The deterioration of the most important nutritional characteristics of the Russian population, the growth of food poverty, have become one of the most negative results of the reform of the agri-food sector. In conditions when a course is taken to ensure a new quality of growth in the agri-food complex of Russia, an objective analysis of the causes of the current situation in the field of food consumption, an assessment of the adequacy of the existing food consumption management system to the requirements of today's realities of the socio-economic development of the state is necessary.

An increase in consumption of basic food products per capita was identified as an important result of the implementation of the priority national project "Development of the agro-industrial complex". Particular attention in this document is paid to the consumption of livestock products. At present, Russia significantly lags behind the developed countries in terms of per capita consumption of meat and meat products: in the USA it is 115 kg per year, in France - 94 kg, in Germany - 86 kg, in Russia - less than 53 kg. If we take into account that this is an

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<sup>2</sup> This work was carried out with financial support from the Russian Foundation for Humanities (Grant No. 05-02-02149a)

average characteristic of the consumption of this product, it is obvious that the situation in the low-income strata of the population is much worse.

The Government of the Russian Federation within the framework of the priority national project "Development of the agro-industrial complex" has identified a wide range of tasks and ways of their implementation in the field, first of all, increasing the commodity supply of livestock products based on the support of domestic producers. It is also extremely important to coordinate the growth of the commodity supply of agricultural products with the value of the effective demand of all groups of the population for a real increase in living standards by optimizing one of its most important parameters - food consumption to ensure the economic availability of those food products that are necessary for the normal functioning of the human body.

A comprehensive analysis of the sphere of food consumption in one of the typical regions of southern Russia - the Saratov region - indicates the presence of multidirectional trends in it in recent years.

As an undeniably positive phenomenon in 1997-2004. the decrease in the average per capita consumption of bread products, potatoes and vegetable oil, the so-called "Giffen's goods", can be estimated by 0.9, respectively; 26.6 and 15.2 percentage points, and an increase in the average per capita consumption of meat products and vegetables - by 28.2 and 11.3 percentage points. At the same time, a negative tendency can be noted to reduce the average per capita consumption of dairy products and eggs (by 18.1 and 18.6 percentage points), since it is these products that are the source of the protein component of nutrition, primarily for low-income strata of the population.

The presence of certain problems in the consumer and food market of the region is evidenced by the decrease in the "savings quota" from 6.1% in 2003 to 4.4% in 2004 and 3.6% in the II quarter of 2005, the calculation of which is carried out according to the data of the income and expenses of the population of the Saratov region. In addition, in the first quarter of 2005, a situation was noted that disrupted the smooth functioning of the consumer market, which manifested itself in an excess of expenses over incomes in the amount of 0.03% of the amount of expenses, which was atypical for the post-crisis period. In the future, the considered ratio of income and expenses was again established at the level of 9% - 10% of the amount of cash income.

An analysis of the consumption of basic food products by the population will be incomplete and insufficiently objective if a differentiated approach is not used based on data from budget statistics.

In accordance with the recommendations of the FAO (World Food Organization), the normative caloric intake of the diet should be 2600 kcal per day, the critical calorie content is estimated by experts as 2000 kcal per day. 2002 - 2004 there was a decrease in the calorie content of the entire population of the region from 2934.9 to 2718.0 kcal. In 2004, in the first and second income groups, the calorie content of the diet was below the threshold value, amounting to 1461.7 and 1938.8 kcal, respectively.

An important part of a healthy diet is its chemical composition. 2002 - 2004 the consumption of proteins by the population of the region lagged behind the norm, moreover, during this period there was a decrease in the consumption of proteins in the daily diet by 6.4 percentage points, while the consumption of fats and carbohydrates also decreased - by 3.5 percentage points. and 9.7 p.p. Fat consumption, although it decreased in 2004 compared to 2002, did not exceed the norm by 51.6%. The consumption of carbohydrates was 12.3% less than the norm. Differentiation in the consumption of proteins, fats and carbohydrates was 2.6, respectively; 2.9 and 2.3 times. In the first income group, the consumption of proteins was 2.4 times lower than the norm, fat - 1.5 times, carbohydrates - 1.9 times.

A positive point is that in 2002-2004. the downward trend in the ratios of funds for the consumption of basic food products continued. Reducing the gap in food consumption in the extreme decile groups is associated with an increase in real incomes of the population, which makes it possible to better meet food needs. Obviously, the coefficients of the non-food stocks tend to increase.

Differentiation of food consumption also takes place in the territorial context (city, village). In 2004, urban households consumed more basic types of food than rural households, except for grain products.

It should be noted that the differentiation of food consumption was more pronounced in rural areas than in cities. Thus, the ratio of funds for the consumption of meat products in the city was 2.7 times, and in the countryside - 14.7 times, for the consumption of sugar and confectionery - 2.3 and 6.4 times, respectively.

The comprehensive analysis of the sphere of food consumption on the example of the Saratov region allows us to conclude that the existing management system does not help to overcome the negative trends in the growth of food poverty and the reproduction of an irrational diet of the population.

Improving the socio-economic mechanism for regulating the differentiation of food consumption should be based on a serious theoretical and methodological foundation for the study of basic categories.

The problem of differentiation of food consumption, as a special case of socio-economic differentiation of the population, being an integral attribute of market relations, was during the first years of economic reform in the shadow of more global problems. But, turning into a real factor holding back the pace of economic development, in recent years it has attracted more and more attention of scientists. However, when considering this problem, there are many controversial points, differences in definitions, in the assessment of the current socio-economic situation. So, according to Doctor of Economics. A.E. Surinov, Russia in terms of the Gini coefficient can be attributed to the countries with the average value of this indicator, along with Moldova, Kyrgyzstan, China and the United States.<sup>3</sup> ...

Corresponding Member of the Russian Academy of Sciences N.M. Rimashevskaya notes that "inequality in Russia is comparable to those observed in some Latin American countries, which are characterized by the highest degree of polarization."<sup>4</sup> ... And if A.E. Surinov relies on the data of official statistics, then his opponent rightly shows the inaccuracies in assessing the state statistics of the processes of socio-economic differentiation. It is important to expand the system of indicators for assessing the level of socio-economic differentiation, especially at the regional level, improve the methodology for calculating traditional indicators, in particular, the coefficient of regional differentiation by income.

The social protection system in our country is in the stage of active reform, and here it is important to use the positive experience that exists in countries with different models of social protection. In particular, it is advisable to focus not only on providing financial assistance to the poor, but also on carrying out specific work to organize a normal level of nutrition (the food stamp system in the United States).

Promising is the formation of a state policy in the field of rational nutrition, including the promotion of healthy nutrition through the mass media, the spread of a culture of reasonable consumption as an important element of a healthy lifestyle. And, of course, an urgent problem is the change in state policy in the field of income and taxation in order to create conditions for the necessary reforms of the health care system and housing and communal services. It is also obvious that there is a need for a transition in the regulation of the social sphere

<sup>3</sup>See: A.E. Surinov. The standard of living of the population of Russia: 1992-2002 - M.: ISC "Statistics of Russia", 2003, p. 170.

<sup>4</sup>See: Social protection of the population // Ed. N.M. Rimashevskaya. - M., 2002, p. 42. (Institute of Socio-Economic Problems of Population).

from a living wage, which is a budget for survival in crisis conditions, to a minimum consumer budget that ensures the normal life of a person, preserves his health and satisfies the most important socio-cultural needs.

**WHAT DEFINED THE DEPTH OF THE DECLINE  
IN THE CRISIS PERIOD?**

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*Gurvich E.T., Prilepskiy I.V.  
Economic Expert Group, Moscow  
E-mail: qurevich@rambler.ru*

*The paper discusses the factors that determined the significant cross-country variation of the economic recession during the crisis period. Regression analysis was carried out for a sample of 172 countries; in addition, the groups of developing and oil-producing countries are considered separately. The results obtained showed that factors representing three different sources had a significant impact on the depth of the recession: financial and trade channels for the spread of crisis shocks, as well as the presence of economic imbalances in the pre-crisis period. The constructed model has rather high explanatory properties. The contribution of various factors to the economic recession is calculated for developing countries and countries with emerging markets on average, as well as for Russia. Based on the results obtained, recommendations are proposed to reduce the vulnerability of the Russian economy to future crises.*

*Key words:* crisis, recession factors, financial and trade shocks, cross-country analysis.

*Keywords:* crisis decline factors, financial and trade shocks, regression analysis.

**1. Introduction**

The global economic crisis of 2008-2009, provoked by problems in the financial system of developed countries, led to an unprecedented drop in production in the post-war history: the decline in world GDP in 2009 was 0.6% (and when calculated on the basis of market exchange rates - 2, 0%). The growth of the world economy slowed down significantly already in 2008 (down to 3.0% compared to 5.2% in 2007). At the same time, the flows of goods and capital between countries sharply decreased. The volume of international trade contracted by 10.7% in 2009, and net capital inflows to developing countries fell in 2008-2009. 3.5 times.

The uniqueness of the crisis is also in the fact that it covered almost the entire world: a drop in production, according to the results of 2009, was recorded in half of the countries (91 out of 183 included in the database of the IMF World Economy Review (IMF, 2010a), while in 2007, there were only three such coun-

tries), growth slowed down in 2009 compared to the pre-crisis 2007 in 166 out of 183 countries. The acceleration has been seen in only a few of the poorest countries in Africa and in select countries recovering from external and internal conflicts, such as Afghanistan and Zimbabwe. At the same time, the dynamics of production in 2008-2009. characterized by high cross-country variation. So, excluding the countries of the last specific group, the five countries leading the fall in 2009 showed a decrease in GDP for an average of 15.3 p.p. in year; The GDP of the leading growth countries increased by an average of 9.0 percentage points. in year. The difference in growth rates between leaders and outsiders was 24.3 percentage points. against 20.3 p.p. in 2007; the standard deviation of growth rates increased to 4.8 p.p. (compared to 4.0 p.p. in 2007).

Чем определялась глубина спада в кризисный период?

анализу дифференциации кризисного спада	Число стран в выборке	R <sup>2</sup>
Значимые переменные, включенные в уравнение		
Кредитный рычаг, режим курсовой политики, рост кредитования (слабая зависимость), при соединение к ЕС (дамми переменная)	40	0,64
Привлечение кредитов из развитых стран, доля продуктов питания в экспорте	93	0,24-0,26
Краткосрочный внешний долг	29	0,46
Сальдо счета текущих операций, рост частного кредита (оба показатели в % ВВП), логарифм душевой величины ВВП в 2007 г.	162	0,44
Те же	87	0,44
Сальдо счета текущих операций в 2006 г., качество регулирования финансового сектора, логарифм душевой величины ВВП в 2007 г.	75	0,41
Качество регулирования финансового сектора	45	0,46
Задолженность перед иностранными банками, внутренний спрос торговых партнеров, международные резервы (по отношению к сумме краткосрочного долга и сальдо счета текущих операций)	41	0,29

The pronounced differentiation of countries by the scale of the crisis recession gave impetus to the study of possible reasons for the observed differences (Berkmen, Gelos., Rennhack et al., 2009; Blanchard., Das, Faruqee,

2010; Lane, Milesi-Ferretti, 2010; Rose, Spiegel, 2009, 2010; IMF, 2010b). If at the first stage of studying the crisis, economists set the task of identifying the general factors that determined the recession in the world economy, then in the above series of works, a different logic is used. The authors try to find out how the countries that experienced the greatest recession differed from the countries where the recession was relatively weak. At the same time, both the parameters of the economy and the characteristics of economic policy can be included in the

Результаты регрессий на широких выборках

Спецификация	M1	M2
Выборка	Все страны	Все страны без малых и беднейших
Доля экспорта в ВВП	-1,747** (0,880)	-1,874* (1,059)
Сальдо текущего счета	6,071** (2,460)	5,136 (3,821)
Подушевой ВВП	-0,028*** (0,010)	0,007 (0,014)
Фиксированный курс	0,131 (0,447)	0,024 (0,559)
Фиксированный курс* дамми для экспортёров нефти		0,176 (1,209)
Дамми ограничений на потоки капитала		0,263 (0,497)
Частный долг/ВВП		-0,675*** (0,220)
Рост в торговых партнерах		0,878*** (0,270)

number of analyzed variables, which makes it possible to assess the effectiveness of its various options.

The dependence of the recession on certain characteristics indicates that they are directly or indirectly related to crisis mechanisms. The quantitative parameters of the constructed equations allow one to compare the significance of various channels of the crisis propagation. Research findings can be of practical value: they show which variables need to be controlled in order to reduce the depth of future crises, and how different economic policy options affect the resilience of the economy.

The previous discussion of the origins of the crisis (see, for example, (Blanchard, 2008; CEPR, 2008)) can be summarized as follows. In developed countries, the main role was played by a combination of conditions prevailing in the financial sector in the 2000s: low interest rates, massive capital inflows, increased financial leverage, accelerated lending, weakening government control over some segments of the financial system and new financial instruments. The result was an excessive growth in demand (overheating of the economy) in many countries, which would sooner or later require correction, an excessively rapid accumulation of debt, a decline in the quality of loan portfolios, and a general instability of the financial sector (often hidden for the time being). The key channels for transferring the crisis to developing countries are recognized, firstly, reduction of domestic and foreign lending (which is determined by the rapid reduction in leverage and the "flight of creditors to quality" as a result of a radical reassessment of financial risks), and secondly, trade shocks (associated with a decrease in demand from the first developed, and then most of the rest countries). This led to a contraction in export, investment, consumer, and in some cases, government demand.

Quantitative studies of the factors of the crisis are still at an early stage. First, only recently there have been estimates of changes in GDP for 2009, which accounts for the bulk of the recession in the crisis. Secondly, according to the authors themselves, the quality of explanation of intercountry differences obtained so far cannot be considered satisfactory, which indicates the need to continue research. Third, the results of different studies are often similar at the level of general conclusions, but there are serious differences in assessing the role of specific factors depending on the used recession indicator, sample of countries, etc.

The present work contributes to the considered problems in several directions. This is one of the first studies to use post-year 2009 GDP data to apply a slightly different measure of recession. Further, previous studies have shown that the decline in oil-producing countries is poorly explained by general factors (which led some authors to exclude this group of countries from the sample). This article is the first to attempt to examine the factors of decline within a group of oil-producing countries. The quality of some of the models obtained in this work is superior to the previously published versions. Finally, the equations constructed are used to discuss the factors behind the decline in the Russian economy.

## **2. Results of previous studies**

In one of the first works on the problem under consideration (Rose, Spiegel, 2009), the following general concept was formulated, within the framework of which all subsequent studies fit.

The consequences of the crisis are described by a set of variables  $y_{ij}$  (where  $i$  means a country,  $j$  is one of the crisis effects). In most studies, the analysis is limited to indicators related to the decline in production (although this decline is also described by a whole set of indicators). The size of the effect depends on such unobservable (latent) influences  $\zeta_i$ , such as a decrease in the availability of credit resources (equation (1)). In this case, the impacts are determined by a combination of the observed variables  $x_{ik}$  representing external shocks, parameters of the state of the economy, etc. (equation (2)). Substituting equation (2) in (1), we exclude latent variables from consideration, and the problem is reduced to constructing a relationship between the effect of the crisis and the factors  $x_{ik}$  according to cross-country data.

The published works on the factors of differentiation of the crisis recession differ in the indicators of the crisis recession used, the sample of countries, and the set of potential factors. Here is a brief overview of the results.

All the many indicators of the impact of the crisis on production that have been used can be divided into two groups. Some studies use one or another estimate of the dynamics of GDP, while others study the deviation of this dynamics from the expected growth rates or from the trends prevailing before the crisis. The second approach seems preferable, since it is he who measures the actual impact of the crisis, while in the first approach the analyzed indicators are partially determined by the dynamics that developed in the pre-crisis period, and only partly by the impact of the crisis itself.

Several indicators are considered as indicators of production dynamics: change in GDP in 2008–2009, assessment of GDP growth rates in 2009 according to the consensus forecast, decline between the peak and the bottom of production. The "background" growth, from which the crisis deviation was counted, was also determined in several ways: as the IMF forecast (or consensus forecast for the corresponding period, prepared before its beginning), as the average economic growth rates for 1995–2007. or for 2005–2007.

Potential factors of differentiation of the crisis recession can be divided into several groups related to different channels of the potential impact of the crisis.

**Trade channel.** It includes two categories of variables: a) describing the trade shock to which various countries were subjected, and b) describing the vulnerability of the economy to trade shocks.

It turned out to be useful to decompose the impact to which the economy is exposed through the channels of international trade into two parts: a price shock (ie, a change in prices for exported and imported products) and a “volume” shock (a change in the physical volume of external demand). Price shocks were described as individual changes in the terms of trade or changes in prices for certain types of commodities. Volume shocks were calculated by aggregating changes in production or domestic demand in trading partner countries. As for the potential vulnerability of countries to foreign trade shocks, it was characterized by the degree of openness of the economy, the ratio of exports to GDP, and the commodity structure of exports.

**Financial channel.** The size of a financial shock (i.e., a reduction in the availability of credit) is determined by a combination of several categories of factors: a) a general reduction in cross-border capital flows, b) the course of the crisis in a given country, c) exogenous characteristics of the financial system and the economy as a whole, not related to the course of the crisis ... We are obviously only interested in the factors of the third group. These mainly include indicators of the state of the economy on the eve of the crisis, which determine the financial stability of the country, its “margin of safety” before possible shocks. In particular, this group of variables includes: current account balance, external debt in different definitions (full, private, short-term), gold and foreign exchange reserves, stock market growth (“bubbles” in the stock market created conditions for a sharp decline in the value of securities,

**Imbalances in the economy.** It is generally recognized that one of the sources of the crisis was the expansive Zionist macroeconomic policy, manifested in credit pumping, rapid growth in external debt, the appearance of bubbles in the stock and real estate markets, etc. The imbalances accumulated before the crisis can influence the decline in production in several ways. First, excessive domestic demand (overheating of the economy), sooner or later, inevitably leads to its subsequent correction. And the more the demand is "inflated", the greater, other things being equal, is the correction. Second, work on the analysis of the causes of the international financial crisis showed that one of the central places among such causes was occupied by the excessive growth of leverage. The more values it reached in a country in the pre-crisis period, the more correction was required to return it to normal values. Thirdly, large fiscal deficits or public debt indicate the need to adjust government consumption and / or transfers, while surplus and accumulated reserves suggest that the government has the ability to mitigate the impact of the crisis by offsetting the decline in private demand with tax cuts or increased government spending. In the studies under consideration,

this group of factors included: the size of the leverage, budget balance, government debt, inflation rates, the dynamics of lending in the pre-crisis period, the dynamics of the stock market growth. offsetting the decline in private demand by lowering taxes or increasing government spending. In the studies under consideration, this group of factors included: the size of the leverage, budget balance, government debt, inflation rates, the dynamics of lending in the pre-crisis period, the dynamics of the stock market growth. offsetting the decline in private demand by lowering taxes or increasing government spending. In the studies under consideration, this group of factors included: the size of the leverage, budget balance, government debt, inflation rates, the dynamics of lending in the pre-crisis period, the dynamics of the stock market growth.

**Economic policy regime.** The policy regime used on the eve of and during the crisis largely determines, on the one hand, the scale of accumulated macroeconomic risks, and on the other hand, the economy's ability to adapt to crisis shocks.

The most important are the following characteristics.

1. Exchange rate regime. It can be expected that the use of a floating exchange rate allows the economy to better adapt to external shocks.
2. Using the inflation targeting regime. This regime implies greater flexibility in exchange rate policy, so it may also be preferable in times of external shocks.
3. The quality of regulation of the financial system. Reflects a wide range of characteristics: regulatory restrictions on financial risks, the quality of prudential supervision, requirements for the transparency of financial institutions, etc.

Of course, our proposed classification of factors is conditional, in addition, some of them operate through several channels. However, their structuring is necessary for further discussion of the qualitative conclusions from the results obtained.

A general idea of the results obtained in the main works is given in table. 11... Even a brief review shows that factors associated with financial shocks (such as the dependence of the economy on external financing measured in one way or another) and imbalances accumulated in the pre-crisis period (short-term external debt, excessive increase in leverage, overheating of the economy) are mainly significant. ... This allowed some authors (Berkmen, Gelos, Rennhack et al., 2009; Blanchard, Das, Faruqee, 2010) to draw a general conclusion that in most cases the financial channel played the main role in the spread of the crisis. The trade channel significantly influenced production in those developing countries that are less integrated into the global financial system. Several studies

have also identified the significant impact of the policy regime. So, in the work (Berkmen, Gelos, Rennhack et al., 2009), the authors found that a flexible exchange rate regime helps to better cope with shocks, and the authors (Rose, Spiegel, 2010) concluded that high quality regulation of the financial sector mitigates the impact of the crisis. Description of variables and data

This paper examines the factors of the recessionary crisis for a sample of 172 countries represented in the database of the IMF World Economy Survey 2007–2010. (with the exception of a few countries in which there were military and / or internal political conflicts - such as Zimbabwe, Afghanistan, or for which key data were missing). The sample contains 23 developed and 149 developing countries.

As the main indicator of the crisis recession, we used the difference between the actual average growth rates in 2008-2009.

E.T. Gurvich, I.V. Prilepsky

1 Note that, along with the equations presented, some of the studies under consideration contain a large number of regressions. In particular, (Rose, Spiegel, 2009, 2010) use the principle of constructing all possible equations for the maximum possible number of explanatory and explainable variables and the growth rates predicted by the IMF before the active phase of the crisis (for 2008 - the forecast from April 2007, for 2009 - forecast from April 2008). This variable seems to have important advantages over other previously considered indicators of the crisis, since it allows us to take into account the following important circumstances:

- by the time the crisis began, different countries were at different stages of the economic cycle (in many countries, the economy was overheating). At the same time, in 2008, inertial dynamics still played an important role (the correlation of growth rates with growth in 2007 or with average indicators for 2005–2007 was 0.53);

different groups of countries are characterized by different standard rates and volatility of production growth. So, for developed countries, lower values of these indicators are typical.

The differences between the main ways of measuring the impact of the crisis on production can be illustrated by the example of Azerbaijan. The growth rates in this country were in 2008-2009. 10.0%, according to this indicator, the country was among the world leaders and ranked third. However, this high growth rate was significantly (18.5 percentage points) below the average for the 2005-2007 period. According to this criterion, Azerbaijan ranked second to last.

The production slowdown was partly due to the stabilization of oil production and is therefore predictable. Due to this, the deviation of GDP growth from the expected level was half as much and amounted to 9.3 percentage points. The variable we are using is different from all the previously used ones. It is closest to work (Berkmen, Gelos, Rennhack et al., 2009), however, in contrast to it, we use factual,

It is striking that almost all of the countries on the list represent the former Soviet Union, including Russia as the “leaders” of the recession. The list contains three oil-producing countries and one developed one. Note that the list includes economies with significant recession (countries in the Baltics, Ukraine), a moderate recession against the background of expected rapid growth (Georgia, Russia) and countries with high but below forecasted growth (Azerbaijan, Angola). Noteworthy is the fact that among the "leaders" of the recession were almost all countries that had a record current account deficit before the crisis (in 2007, its ratio to GDP was 15 for Lithuania, 18 for Estonia, 20 for Georgia, Latvia - 22%). In all likelihood, countries with such an external account deficit are doomed to collapse if the situation on international financial markets deteriorates. It is more difficult to understand the principles by which the circle of countries was determined that relatively painlessly survived the crisis. The top five were Ethiopia, Malawi, Rwanda, Uruguay and Oman. In general, these are countries that are minimally integrated into the system of international finance,

As in other works, we also considered alternative indicators of the crisis recession, using them to test the robustness of the results obtained. This is the growth data for 2008-2009. (or only for 2009) minus growth in the pre-crisis (2005–2007) or longer term (1995–2007) period.

The following indicators are considered as potential factors of decline in this paper.

#### **Trading channel**

▪ *Changes in the terms of trade* in the IV quarter. 2008 (the passage of the "bottom" most of the prices for raw materials) compared to the II quarter. 2008 (passing the peak of oil prices). It characterizes the external price shock.

*Aggregated deviation of the magnitude of the crisis recession from the forecasts in countries-trading partners* in 2008-2009 It characterizes a “volumetric” trade shock.

*Export share in GDP in 2007* This indicator measures the vulnerability of an economy to trade shocks.

### **Financial channel**

*Current account balance in 2007...* For exporters of hydrocarbons, the balance was cleared of "opportunistic" export revenues2... The construction of such a variable is due to an attempt to identify the "structural" size of the current account balance, which characterizes the potential dependence of oil-producing countries on external financing at oil prices corresponding to long-term average values.

*External debt (total; private; short-term)* as a percentage of GDP at the end of 2007

*Amount of gold and foreign exchange reserves* as a percentage of GDP at the end of 2007

### **Imbalances in the economy**

*Lending growth in the pre-crisis period* (change in percentage points of GDP for 2004-2007).

*Balance budget* in percent of GDP in 2007 (for oil-exporting countries - non-oil balance in percent of GDP).

*State debt* percent of GDP (2007).

*Sovereign wealth funds* in percent of GDP (at the end of 2007).

*Inflation rate* (2007).

*General measure of pre-crisis overheating of the economy* - the difference between the average growth rates in 2006-2007 and 2001-2005.

*Stock market capitalization growth* (change in percentage points of GDP in 2004-2007). Reflects the possibility of excessive growth in the value of assets.

### **Economic policy regime**

*Exchange rate regime*. Two options were distinguished here: a fixed or a relatively flexible exchange rate (floating or managed floating).

*Restrictions on capital inflows* (binary classification based on the 2007 IMF report).

Additionally, per capita GDP in 2007 and regional dummy variables were used as control variables. The sources of information were data from the IMF,

World Bank, OECD, World Trade Center and national agencies. 4. Construction of cross-country equations for the variation of the crisis recession All countries

In the first step, an attempt was made to identify the factors of recession for the widest sample of countries. As shown in column 1 of table. 3, the current account balance, the share of exports in GDP and GDP per capita turned out to be significant and had the expected sign. No significant impact of the exchange rate regime and restrictions on capital flows was found in such a large sample. The quality of the explanation for the differentiation of the crisis recession cannot be considered satisfactory ( $R^2 = 0.10$ ).

In this regard, small economies with a GDP volume of less than \$ 3 billion in 2007 were excluded from the sample (mainly, these are the poorest countries in Africa and the dwarf states of the Caribbean). Some of the previous studies also excluded countries with low per capita or total GDP (IMF, 2010b). Explanatory variables were added such as growth deviation in trading partner countries and the ratio of private external debt to GDP (specifications with short-term debt and total external debt were also considered, but in this case the coefficients were less significant and the quality of the explanation was worse). The results are shown in column 2 of table. 3. As can be seen, all the coefficients have the expected sign, with the exception of GDP per capita, which lost its significance after excluding the poorest countries, who, on average, were the least affected by the crisis; growth in trading partners and debt / GDP ratios are highly significant; the significant impact of exchange rate policies and restrictions on capital inflows remains unclear. The explanatory power of the model has improved significantly (while keeping only the variables of the first specification  $R^2$  would rise to 0.18).

The robustness of the results for the M2 model was tested using alternative dependent variables - growth in 2008–2009. or 2009 minus average growth in 1995–2007 or 2005–2007. In all of these specifications, the coefficients of the variables significant in the original specification retained their sign; in two cases, restrictions on capital flows became significant (with the expected sign); the proportion of the explained variation turned out to be somewhat larger ( $R^2 = 0.41\text{--}0.43$ ). This shows that the variant of determining the size of the crisis recession, which we use as the main one, is more difficult to model.

When analyzing the factors of decline, it seems justified to further narrow the sample due to its heterogeneity. For example, most developing countries, as you know, unlike developed ones, survived the initial phase of the crisis practically without consequences due to the relative isolation of their financial systems from problem assets. During the active phase of the crisis, a significant

number of developing countries suffered from the deterioration of the terms of trade, while for the vast majority of developed countries, they improved. Such differences in the data are indeed traced: for example, when specification (2) is limited for a subsample of developed countries, the previously significant coefficients turn out to be insignificant (except for the coefficient for external debt, which, however, also loses its significance when Ireland is excluded from the subsample). In this regard, further analysis was carried out separately for developed and developing countries (including countries with emerging markets); a group of hydrocarbon exporting countries is additionally considered.

Calculations aimed at identifying the main drivers of recession for developed countries led to mostly negative results: in addition to private debt and the fixed rate dummy, other variables (including public sector debt and budget deficits, which, as one would expect, could influence the potential size of the anti-crisis measures and, thus, the magnitude of the recession) were found to be insignificant under at least two possible specifications of the dependent variable. The explanatory qualities of the model using significant variables are low given the small size of the subsample ( $R^2 = 0.30$ ). In the following, more substantive results obtained from a sub-sample of developing countries are described in detail.

#### **R**developing countries

The sample of developing countries included 149 economies. When studying it, the variables considered earlier were added: changes in the terms of trade, growth in lending in the pre-crisis period, inflation in 2007, budget balance. These variables turned out to be insignificant in the “large” sample, however, due to the peculiarities of the spread of the crisis in developing countries, one might expect that some of them would be significant for this sample. *A priori*, one would expect that countries less affected by the fall in commodity prices experienced less recession. Countries with higher credit growth (a possible sign of overheating economies) were more likely to experience a stronger recession. The coefficient for inflation as a negative characteristic of pre-crisis macroeconomic stability should be negative,

During the calculations, it turned out that the introduction of new variables negatively affects the significance of some previously used variables, in particular, the current account balance. This is likely due to the significant negative correlation between this variable and lending growth (-0.47): in many countries, current account deficits reflected significant inflows of foreign bank capital that stimulated lending. Also insignificant (or insignificant in some specifications) is the ratio of exports to GDP.

The following were consistently significant in all regressions, as well as when using alternative specifications of the dependent variable: private sector debt, credit growth, and growth of trading partners. The change in the terms of trade turned out to be weakly significant for some and weakly insignificant for other variants of the dependent variable, while the coefficients always have the expected sign and are resistant to the addition of new regressors. These four variables were ultimately chosen as the basic factors of the decline (Table 4, model M3). The corresponding model is hereinafter referred to as "base".

In contrast to the results obtained in (Berkmen, Gelos, Rennhack et al., 2009), it is not possible to reveal the dependence of the recession on the exchange rate policy regime in the considered subsample of countries (Table 4, model M4). The hypothesis that countries that impose restrictions on capital flows were less affected by the crisis was also not confirmed. The influence of pre-crisis inflation is insignificant (this result does not depend on the specification of the dependent variable).

By analogy with the work (Blanchard, Das, Faruqee, 2010), an additional factor of external financial vulnerability was also considered - short-term debt. The results are shown in column 3 of table. 4 (model M5). Changing the specification does not improve the explanatory properties of the model; the significance of the debt ratio decreases; there is a slight increase in the significance of the coefficient under the terms of trade.

In the aforementioned work (Blanchardetal., 2010), as well as in the analytical section of the EBRD report (EBRD, 2009), the hypothesis was also put forward and tested that, all other things being equal, countries with a predominance of debt obligations to banks of developed countries in the structure of external debt less recession. The basis for this hypothesis was the fact that large Western banks had a significant "margin of safety" and made significant injections of resources into their subsidiaries in developing countries. In both works, this hypothesis was confirmed. In our study, when debt to banking organizations and other external debt are included in the regression separately, both corresponding coefficients are significant and negative, but the coefficient for debt to banks is higher in modulus (however, Wald's test does not reject the hypothesis of equality of coefficients). Thus, the findings of these studies appear to be volatile with respect to changes in sample size (Blanchardetal., 2010) and changes in the dependent variable (the EBRD report used the difference between growth in 2009 and average growth in 1999-2008.) ...

As in a number of previous works, we considered it appropriate to consider the sample with excluded hydrocarbon exporting countries. The explanatory

properties of the model have improved markedly. Indicator R2 increased to 0.57, which cannot be explained solely by reducing the sample size to 66 countries<sup>3</sup>...

The results indirectly indicate that the development of the decline in production in oil-producing countries had its own specifics. The next section attempts to analyze the factors that explain the differentiation of recession between different oil-producing countries.

#### **WITHoil exporting countries**

When studying oil exporting countries, it seems justified to modify the factors described above. First, the current account balance is used, cleared of "opportunistic" oil and gas exports, and secondly, the budget balance is replaced by the non-oil balance (which better reflects the level of fiscal discipline and, in addition, contains information on the level of oil revenues poured by the state into the economy). Further, instead of the ratio of exports / GDP and changes in the terms of trade, the ratio of oil exports to GDP can be used (since the second variable can be expected to be insignificant due to its small variation in the sub-sample). Of particular interest is the inclusion in the number of explanatory variables of the share of the oil and gas sector in GDP; the sign of the coefficient for it, however, is not obvious a priori. On the one hand, the larger this share, the greater the dependence of the economy on oil revenues; on the other hand, with a large value of this variable, the influence of oil and gas revenues on the "full volume" of the real economy is probably not so great - the volume of the non-oil sector is small, and the physical volumes of hydrocarbon supplies from many countries, although reduced, but insignificantly. Finally, it is important to take into account that most of the oil exporting countries in the pre-crisis period accumulated a significant amount of sovereign funds, which could be used to stimulate the economy during the crisis. The example of Norway is indicative in this respect, which, in the conditions of the crisis, resorted to additional - in addition to the fund's profitability - spending from the fund and following the results of the crisis had quite good indicators of a drop in GDP of 1.5%, and of unemployment - no more than 3.1%. with a large value of this variable, the influence of oil and gas revenues on the "full volume" of the real economy is probably not so great - the volume of the non-oil sector is small, and the physical volumes of hydrocarbon supplies from many countries, although reduced, but insignificantly. Finally, it is important to take into account that most of the oil-exporting countries in the pre-crisis period accumulated a significant amount of sovereign funds, which could be used to stimulate the economy during the crisis. An illustrative example in this regard is the example of Norway, which during the crisis resorted to additional - in addition to the fund's profitability -

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The resulting sample includes 24 countries, of which one (Norway) is developed. An attempt to use a modified baseline model for developing countries (using the full external debt due to the limited availability of data for a number of Gulf countries) leads to negative results (Table 5, model M7). In addition to small variation in terms of trade, this effect may be due to the lower income elasticity of demand for raw materials compared to demand for manufacturing products, which may lead to insignificant growth rates in trading partner countries. The inclusion of additional variables does not improve the quality of the model (Table 5, model M8 - a number of fiscal variables are included). When examining all factors, only two are the growth in government spending as a percentage of GDP in 2004-2007. and the ratio of capital inflows to GDP in 2007 - significantly affect growth, but the signs of the corresponding coefficients contradict the hypothesis about the influence of pre-crisis overheating on the recession. Only the pre-crisis overheating variable is consistently significant in all specifications. It should be borne in mind, however, that this variable may not be strictly exogenous, since the rapid growth in 2005–2007. could have a positive effect on the IMF forecasts for 2008-2009.

In the future, calculations were also carried out using an alternative dependent variable, which takes into account the dynamics of GDP not in 2008-2009, but only in 2009. The motivation for this is as follows: the initial variable was built taking into account the fact that many countries found themselves in a recession already at the end of 2008 d. However, most of the oil exporting countries showed strong growth in 2008, and in some of them (Qatar, Oman, Equatorial Guinea), this growth significantly exceeded the IMF forecasts. The use of an alternative variable thus allows one to study the actual effect of the crisis. The models built on its basis are distinguished by a greater explanatory power; In addition to the overheating variable, the lending growth variable and the dummy variable for the Persian Gulf region turn out to be persistently significant (Table 5, model M9).

Attempts have been made to explain the higher performance of the Gulf countries with the help of their characteristic objective indicators (exchange rate policy, restrictions on capital flows, a high share of the oil sector in GDP), but

they were unsuccessful (for example, Angola, where the role of the oil sector is also especially large, turned out to be one of the leaders in the fall). Perhaps, the resistance of these countries to external shocks (due to the very low cost of oil production) and the significant spread of non-market mechanisms in their economies played a role.

##### **5. Impact of the crisis on lending and capital flows**

It was noted above that both the present work and earlier studies concluded that the financial channel is important in the spread of the crisis. However, these conclusions are based on indirect evidence, such as the negative impact on production of indicators of the economy's dependence on external financing. In fact, it is assumed that the stronger this dependence, the more the capital inflow will decline and the lending will shrink. Let's check if this logic works.

One of the significant factors in our equations was the growth of lending in the pre-crisis period. Excessive growth in lending may mean that banks issued loans for high-risk projects, the profitability of which could significantly decrease during the crisis period. In this case, the volume of "bad" assets increases, and further lending slows down sharply. The "reversal of capital flows" plays an important role, as in many developing countries foreign banks are the most important source of financial resources. Finally, lending can be influenced by the general level of financial stability in the country; the ratio of international reserves to GDP was used as its characteristic. Regression analysis shows that these factors are indeed significant. However, when excluding China from the sample, characterized by a high level of reserves and, at the same time, a record growth in lending in 2009, the ratio at reserves becomes insignificant. After excluding reserves, the model becomes resistant to further exclusion of countries from the sample (Table 6, column 1).

The decline in capital inflows has clearly been one of the most important factors in the recession for many developing countries. To eliminate the problem of endogeneity, the dynamics of capital inflows was analyzed on the basis of pre-crisis indicators of external vulnerability - the current account balance and the ratio of short-term debt to GDP, as well as the openness of the capital account. If the first two factors really turn out to be significant predictors of "capital flight" during the crisis period, then the possibility of free capital transactions again turns out to be an insignificant factor (Table 6, column 2). Thus, we received confirmation of the hypothesis that the factors included in our models are indeed associated with the main indicators reflecting the negative impact on the economy through the financial channel - capital reversal and credit contraction.

Comparison of the baseline model with the equations obtained in previous works shows that, as in the article (IMF, 2010b) (and unlike most other studies), we constructed a regression in which all three main channels are represented by significant factors. That said, our finding applies to a sample of 78 developing countries, while a similar result (IMF, 2010b) applies to a more homogeneous and smaller sample of 41 emerging market economies. Despite this, our model explains much better the differentiation of the recession scales, having  $R^2 = 0.49$ , compared to  $R^2 = 0.29$  in the specified article.

The role of individual factors in cross-country variation in decline can be estimated by calculating the product of the coefficient for each variable by its standard deviation. The results show that the largest contribution is made by private external debt (1.0 pp); the growth of trading partners explains 0.8 pp, and the growth of lending - 0.7 pp. variations (the component in this subsample is 3.1 pp). The trade channel turns out to be a significant, although not the dominant factor in differentiating the scale of the crisis recession across countries.

The resulting basic model also makes it possible to decompose the scale of the crisis recession (and not its variation, as above) into separate channels, taking into account both the size of various shocks and their impact on production. Table 7 shows the calculated contribution to the decline in production of each factor for the considered subsample of 78 countries on average, as well as for 10% of outsider countries and 10% of leading countries. In general, for all countries, the trade channel explains 65% of the decline, while the share of the financial channel and pre-crisis imbalances account for 22 and 13%, respectively. We will get different conclusions if we look at how the model explains the difference between the worst decile of countries from the entire sample: the financial and trade channels explain about 40% of the observed difference, and imbalances - the remaining 20%.

Thus, the key general conclusion of our study is that the recession was determined by a set of factors related to the three main channels (financial, trade and cumulative imbalances) and had a comparable impact on production. At the same time, the role of the trading channel turns out to be much greater than in previous publications. The basic and some other specifications found a significant effect of both the reduction in the physical volume of external demand and the terms of trade on the decline in production. Note that the effect of trade shocks does not crowd out, but complements the action of other channels, which also remain significant.

How can you explain the difference between these conclusions and most of the previously obtained results? In our opinion, this may be determined by the

expansion of the period during which the dynamics of production is recorded. The various channels for the spread of the crisis should not be regarded as alternative; in fact, they were linked by complex interactions, complementing each other. At the initial stage of the crisis, it seems that the main role was played by factors related to the financial system. At the next stage, judging by our results, the contraction in international trade came to the fore (which, in fact, became a derivative shock caused by the initial contraction in demand)4... Both the scale of external influences (in particular, capital turnover) and the economy's response to them, at all stages, were largely determined by the imbalances accumulated in the economy. This picture allows us to combine the conclusions of earlier works with our results, removing the apparent contradiction between them.

Let us note the rather good explanatory properties of the basic model. The sample of our base M3 model is comparable to the P2 and P7 models from previously published works, which either analyzed data for a significantly smaller number of countries, or significantly lower $R$  2... The M6 model is based on a sample close to the sample of the P5 model, having a higher R value compared to it.2... The unexplained part of the recession can be attributed to such individual factors as the flexibility of the economy (its ability to adapt to shocks), the "quality" of the financial system, the actions of the government and the central bank during the crisis, the degree of trust of economic agents in the policy of the authorities, support (or lack thereof) from international financial organizations, etc.

From table. 7 shows that the relative accuracy of forecasting the decline in the leading countries is much worse than in the rest of the sample. This suggests that while bad results during a crisis provided a general explanation, good results were largely determined by individual circumstances. For some countries, this could be the receipt of official development assistance (Ethiopia), for others - strict state regulation of the economy (Belarus), etc.

## **7. Recession factors for Russia**

Judging by the factors we included in the basic model, we must conclude that a deep decline in production in our country was natural.

*Financial factors:* private external debt at the end of 2007 amounted to \$ 261.4 billion (20.2% of GDP, which is significantly higher than the median value for the sample - 11.2% of GDP), while at the end of 2003 it was only 76 , \$ 7 billion. The current account deficit (cleared of "excess" oil and gas export revenues) amounted to 5.6% of GDP. Based on these data, the model of changes in

capital inflows described above predicts a fall in GDP by 5.5 percentage points. In fact, it amounted to 11.0 percentage points. due to the presence of a number of factors specific to Russia (in particular, a significant direct dependence on oil prices and their changes, as well as the exchange rate policy pursued by the Central Bank).

*Trading factors:* the decline in the countries - trade partners of Russia amounted to 6.9%. It should be noted, however, that actual exports in physical terms decreased by only 4.7%. In contrast to countries exporting mainly manufacturing products, the main negative shock for Russia was the shock to the terms of trade (the deterioration of which was 33.8% in Q4 2008 compared to Q2).

*Economic policy factors:* it can be concluded that in the pre-crisis period the necessary measures were not taken to prevent overheating of the economy. For example, Russia was one of the few oil-producing countries in which government spending in 2003-2007. grew as a percentage of GDP. In 2007, the non-oil budget deficit amounted to 5.2% of GDP. Exchange rate policy, along with capital account liberalization in 2006, contributed to an increase in volatile short-term capital inflows and an increase in foreign exchange imbalances. The volume of lending increased from 16.8% to 37.8% of GDP in 2003-2007. (Taking into account the fall in capital inflows, the model considered above predicts a fall in the growth rate of the loans / GDP ratio in the amount of 2.4 percentage points; the real decline was 2.5 percentage points).

The decline in production in Russia was observed for three consecutive quarters: from the IV quarter. 2008 to II quarter. 2009 It began later than in most developed and a number of developing (mainly Eastern European) countries, which up to a certain point made it possible to speak of Russia (and emerging markets in general) as an "island of stability". Indeed, the volume of foreign "bad" assets on the balance sheets of Russian banks was small; the role of foreign players in the Russian banking system (unlike, for example, the Baltic countries) was also insignificant. Under these conditions, the capital inflow to the emerging markets continued (for Russia it remained until July 2008) and the rise in energy prices. However, after the bankruptcy of Lehman Brothers in September 2008, investor appetite for risk declined sharply. their expectations about the outlook for emerging markets turned negative, which led to a "flight to quality", difficulties in refinancing external debt, and a fall in commodity prices. As a result, Russia found itself among the key emerging markets (Brazil, South Africa, Turkey), where the decline in GDP began in the IV quarter of 2008.

The obvious direct sources of the downturn for Russia were a trade shock and a stalled capital inflow. Indeed, oil prices in the IV quarter of 2008 fell by 52.5%, which led to a decrease in export revenues (and, accordingly, profitability in the fuel and energy complex) and budget revenues, negatively affected consumer expectations and investor expectations, and became an additional factor of capital outflow. ... The cessation of capital inflow was all the more painful since a significant part of investments and an ever-increasing part of consumption were provided at the expense of external funds in the pre-crisis years. The assumption by Russian companies of excessive foreign exchange risks in the context of a quasi-fixed nominal exchange rate did not allow for a rapid devaluation and mitigate the consequences of the crisis for export-oriented industries, which were already affected by the decline in demand.

Let's see how Russia and other countries compare in all indicators that played a significant role in the drop in production (Table 8). If we compare Russia with a sample of developing countries, then our country is between the median of the sample and 10% of outsiders in terms of two parameters (the size of external debt and a decrease in external demand), in terms of pre-crisis lending growth it is close to outsiders, and in terms of changes in the terms of trade, it significantly exceeds their.

Given above in table. 7 Estimates of the contribution of various factors show that more than 2/3 of the decline in Russia is associated with a trade shock. This is in line with the position of many experts (see, for example (Blanchard., Das, Faruqee, 2010)), who believe that a sharp deterioration in the terms of trade played a leading role in the decline in the Russian economy. Based on the analysis of the recession factors, the following recommendations can be formulated.

*Trading factors.* It is necessary to increase the diversification of exports by product group and region. Despite a slight drop in physical volumes of supplies, due to the effect of the terms of trade, nominal exports from Russia decreased to a greater extent than that of exporting countries of more high-tech products, which indicates that it is not profitable to maintain a raw material orientation, despite the presence of more stable demand. The benefits of geographic diversification are well illustrated by the examples of two Latin American countries, Chile and Mexico. In Chile's foreign trade, as of 2009, 14 countries had export shares exceeding 2%; while the shares of only two countries (USA and Canada) in Mexico's exports were above 2%. As a result of the crisis, the drop in GDP in Chile in 2009 amounted to 1.6%, and in Mexico - 6.5% (deviation from the growth forecast -3.7 and -5.4%, respectively).

*Exchange rate policy...* The flexibility of exchange rate policy should be increased (which has already been done in part by the Central Bank). Despite the fact that this paper failed to show a significant effect of exchange rate policy on the recession, the increased volatility of the nominal exchange rate weakens the inflow of speculative capital and the accumulation of external debt, thereby mitigating the potential consequences of the “sudden stop”.

*Money-credit policy...* Effective and transparent monetary policy aimed at smoothing cycles can mitigate the impact of the crisis. The work (IMF, 2010b) also showed that countries targeting inflation were less affected by the crisis.

Strict monitoring of the financial system and, in particular, capital inflows. In the event of excessive lending growth or an increase in capital inflows not driven by fundamental factors, it is necessary to consider the possibility of increasing reserve requirements. Countercyclical capital requirements are also a potential measure, but implementation of this requirement requires a balanced approach to address the risk of slowing lending. In addition, it is possible to limit excessive external borrowing by companies with state participation.

*Fiscal Policy* must contribute to sustainable development without creating conditions for overheating the economy. It is necessary to contain the growth of expenditures on the basis of conservative budget planning and renew the application of strict budgetary rules. In addition to increasing the level of macroeconomic stability, tight fiscal policy further contributes to a decrease in short-term capital inflows (IMF, 2010c) and a weakening of the real exchange rate of the national currency (Arezki, Ismail, 2010)).

If these recommendations are fulfilled, Russia in the future (in the event of the next financial crisis) may no longer be among the outsiders, but among the leaders.

**Reference:**

**Yudaeva K.V., Kozlov K.K.** (2009): Factors behind the global decline in GDP and industrial production during the 2008 crisis // Journal of the New Economic Association. No. 1–2.

**Arezki R., Ismail K.** (2010): Boom-Bust Cycle, Asymmetrical Fiscal Response and the Dutch Disease. IMF Working Paper WP / 10/94.

**Berkmen P., Gelos G., Rennhack R.** et al. (2009): The Global Financial Crisis: Explaining Cross-Country Differences in the Output Impact. IMF Working Paper WP / 09/280.

**Blanchard O.** (2008): The Crisis: Basic Mechanisms and Appropriate Policies. MIT, Department of Economics Working Paper Series. No. 09-01.

**Blanchard O., Das M., Faruqee H.** (2010): The Initial Impact of the Crisis on Emerging Market Countries // Brookings Papers on Economic Activity. Spring.

CEPR (2008): The First Global Financial Crisis of the 21st Century. [Electronic resource] Access mode: <http://vox.cepr.org/index.php?q=node/1378>, free. Title from the screen. Language. English (date accessed: August 2010).

EBRD (2009): Transition Report 2009: Transition in Crisis? [Electronic resource] Access mode:

<http://www.ebrd.com/russian/downloads/research/transition/TR09b.pdf>, free. Title from the screen. Language. English (date accessed: August 2010).

IMF (2010a): World Economic Outlook. IMF, October, 2010.

IMF (2010b): How Did Emerging Markets Cope in the Crisis? [Electronic resource] Access mode:

<http://www.imf.org/external/np/pp/eng/2010/061510.pdf>, free. Title from the screen. Language. English (date accessed: August 2010).

IMF (2010c): Global Financial Stability Report. IMF, October, 2010.

**Lane P., Milesi-Ferretti G.** (2010): The Cross-Country Incidence of the Global Crisis. IMF Working Paper WP / 10/171.

**Rose A., Spiegel M.** (2009): Cross-Country Causes and Consequences of 2008 Crisis: Early Warning. NBER Working Paper 15357.

**Rose A., Spiegel M.** (2010): Cross-Country causes and Consequences of the Crisis: and Update. NBER Working Paper 16243.

**CONCENTRATION OF PROPERTY IN THE RUSSIAN INDUSTRY:  
EVOLUTIONARY CHANGES AT THE MICRO LEVEL**

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*Dolgopyatova T.G.*

*IAPR NRU HSE, Moscow*

E-mail: dolqoeri@rambler.ru

*The article describes the dynamics of the concentration of property in the Russian manufacturing industry against the background of economic growth in the 2000s and the factors that determined it. The processes of concentration decrease in a number of companies in 2005-2009 are revealed, and a significant positive impact on these processes of quotations of the company's securities in the stock markets, activities in a highly competitive environment in the commodity markets, as well as the size of foreign participation. The negative impact was characteristic of the ownership of Russian private owners and the presence of investment plans by enterprises. The empirical analysis is based on data from two rounds of monitoring of about 1000 large and medium-sized enterprises, carried out by the Institute for Industrial and Market Studies of the State University - Higher School of Economics in 2005 and 2009. Binary and ordinal regressions are used.*

*Keywords:* equity ownership, concentration of ownership, corporate control.

*Keywords:* stock ownership, concentration of ownership, corporate control.

For almost 15 years, researchers of the Russian economy have unanimously supported the thesis that the shareholding that emerged in the early 1990s was characterized by a high level of concentration, and it was practically the same for companies of different sectors and sizes, as well as open and closed joint stock companies (JSC). The mid-1990s saw a rapid increase in concentration, although privatization was initially aimed at creating dispersed ownership. A similar reaction of entrepreneurs to imperfect legislation and law enforcement practices against the background of asset stripping in the interests of managers was predicted by J. Stiglits (1999). Shareholders sought to retain ownership and consolidate control over the business. As a result, the controlling shareholder became the main player in the corporate governance system, in many cases occupying the position of the first executive leader. This helped to overcome the "free rider problem" (large shareholders have incentives to develop their business) and mitigate the "agency problem". The flip side of this method of over-

coming the opportunism of managers was the ignorance of the rights of small shareholders by majority owners and the actual transformation of joint-stock companies into private firms. The question of the degree

The article sets the task of studying the dynamics of property concentration in the second half of the 2000s - during a period of rapid economic growth. The gradual overcoming of the transformational recession created incentives for restructuring enterprises, lengthening the horizon of decision-making by owners and managers, receiving income from an operating and profitable enterprise, rather than transferring its assets to other firms or consumption. All this contributed to the emergence of private business interest in a clearer specification of property rights and investment in production (Dolgopyatova, Ivasaki, Yakovlev, 2009). An institutional consequence of the changes that occurred was the improvement of corporate legislation and law enforcement practice (National Report, 2008, 2009).

For a significant part of the owners of firms, market motives for business development have become significant: the growth of profits and the value of companies, the expansion (preservation) of their share in the globalizing market. The motivation to enter the credit markets, including the world markets, as well as the stock markets with bonds and shares, has increased (Pappé, Galukhina, 2009). The expansion of the practice of placing shares by large businesses, as well as regulatory measures of the state, contributed to the development of the Russian stock market. The evolution of behavior has led to an increase in business demand for corporate governance tools. The owners turned out to be interested in using them to control the activities of hired managers, to comply with corporate governance standards to improve the company's image,

The immediate impetus for the study was the fact that back in 2006. A Standard & Poor's survey of 70 of Russia's largest public companies (Transparency Survey 2006) provided the first evidence of deconcentration of ownership. In our work, we assess trends in concentration changes in "ordinary" manufacturing enterprises (not blue chips, do not represent the fuel and energy sector, are not very large) and the factors that determine these trends.

The empirical basis of the study is the monitoring of the competitiveness of firms, covering up to 1 thousand. manufacturing enterprises (eight types of economic activities) employing at least 100 and no more than 10 thousand people<sup>2</sup>. The first round of monitoring was carried out at the turn of 2005-2006. SU HSE and the World Bank and covered 1,002 enterprises located in 49 regions of Russia. The average number of people employed was 661 (median 315). The second round, carried out in February – June 2009 by the IAPR and

the Levada Center on the order and with the financial support of the Ministry of Economic Development of Russia, covered 1006 companies. The final sample included 957 enterprises from 48 regions, the average number of employed was 587 people (median - 290). The panel sample, in which business leaders participated in both surveys, included 499 objects.

The analysis used data on business entities, which constituted more than 95% of the entire sample and its panel part. They cover three main forms of organization of enterprises: open joint-stock companies, closed joint-stock companies and limited liability companies (LLC). It is for these forms that it is worth discussing the ownership structure and tools for ensuring control over the business. Usually, these issues are considered only for JSCs, but it is no coincidence that LLCs are included in the analysis. Today, integration processes have contributed to the interweaving of LLCs and JSCs in groups of companies, where many parent (management) companies often exist in the form of LLCs, control the activities of open and closed JSCs, which inevitably affects the structure of their ownership and the work of internal corporate mechanisms.

The article is structured as follows. The second section briefly describes the trends in the concentration of ownership in the 1990s - the first half of the 2000s based on the materials of various surveys, in the third, according to monitoring data, the dynamics of concentration and its relationship with the mechanisms of corporate control are presented. In the fourth section, hypotheses are formulated and an empirical analysis of factors that could affect the identified changes is carried out. The final section discusses the results.

## **2. Concentration of ownership in companies: empirical evidence**

Mass privatization initially followed the path of creating a wide circle of shareholders, mainly from among the employees of enterprises (Blasietal., 1997). In the context of imperfect legal institutions, the inability to exercise property rights through dividends against the backdrop of a transformational recession and high inflation, they immediately launched the processes of concentration of a large block of shares in the hands of a small consolidated group or one shareholder. New private joint stock companies were created as companies with a high concentration of capital. The main incentive was the need to establish (for external owners) or preserve, obtain legitimate rights (for managers) control over the activities of the enterprise and its financial flows. Owners and potential investors understood that only significant ownership will protect their rights and place managers under the control within a specific institutional framework. In other words, the impetus for concentration was weak corporate governance (or rather, its absence in the 1990s).

Indeed, the post-privatization history of Russian business is characterized by intensive processes of capital redistribution. According to various polls (Russian Economic Barometer (REB), State University Higher School of Economics, Center for Economic Situations under the Government of the Russian Federation), in the 1990s and early 2000s, approximately 5–7% of companies changed their main owner annually. In the first half of the 2000s, the intensity of redistribution increased slightly - to about 7-10%. Its feature was the transfer of large blocks of shares through both widespread hostile takeovers and voluntary exit from business with a premium for control, which was actively used then by the "red directors". In conditions of high concentration, the main external mechanism of corporate governance is the corporate control market,

All empirical studies of Russian enterprises since the mid-1990s have shown an ever-growing concentration of joint-stock ownership. The share of ownership of the largest shareholder in the capital of industrial enterprises in the early 2000s averaged 25-40%, at the end of the 2000s, according to EW, exceeded 60% (Fig. 1)3... The level of capital concentration increased from year to year, and very quickly the majority of joint-stock companies came under the tight control of one or a close coalition of shareholders. In the early 2000s, the share of companies in which there is a shareholder with a blocking stake in different samples was 30–65%, and companies with more than half of the shares were estimated, according to various testimonies, from 20 to 40% of the samples (Kapelyushnikov, Demina, 2005; Structural changes, 2004). At the same time, for example, at the end of 2002, two-thirds of the heads of open joint-stock companies reported about the presence of an owner controlling an enterprise (Demand Development, 2003).

In the mid-2000s, an extremely high concentration of ownership remained an inherent feature of the Russian corporate sector. According to a representative survey of managers of 822 joint stock companies<sup>4</sup>, almost 70% of the surveyed enterprises were characterized by the presence of a shareholder with a block of shares in excess of half of the authorized capital, 17% of firms had a blocking stake in the hands of the largest shareholder, but did not have a controlling stake. Only 13% of joint stock companies at that time did not have a holder of a blocking stake. Among companies with a controlling stake, less than a third indicated that their companies have a second major shareholder who owns a blocking stake. As a result, almost half of the companies had a controlling shareholder, whose power was not deliberately limited by another large owner. This concentration was equally characteristic of enterprises of different industries and sizes, as well as companies listed or not listed on exchanges.

The extremely high level of ownership concentration in the mid-2000s was also characteristic of the largest business. According to Standard & Poor's data, in 75 Russian companies, which accounted for 90% of the capitalization of all Russian public firms (Portrait of the Board of Directors, 2007), the dominant shareholder owned, on average, 58% of the shares. At the same time, in companies whose shares are traded on foreign stock exchanges, this share did not exceed 50% (in 17 companies listed on the LSE - 56%, in companies listed on the NYSE / NASDAQ - about 34%).

Let us emphasize that, along with the acquisition of additional blocks of shares by the largest shareholder, recorded by surveys, the increase in concentration at the beginning of the decade can also be explained by the increased transparency of ownership relations, more adequate disclosure of information about the owner of blocks of shares that were previously formally divided between other different owners (offshore companies, nominees, various chains of legal entities).

As an intercountry study by R. La Porta and his colleagues has shown (La Porta, Lopez-de-Silanes, Shleifer, 1999), dispersed ownership is by no means the rule. A high level of concentration is inherent in companies in most developed countries, where the "blockholder" model has developed (Kapelyushnikov, 2006). A high level of ownership concentration is observed in all transition economies, despite differences in the initial methods of privatization and in the quality of institutions. In Russia, against the backdrop of violent corporate conflicts, a model of a controlling owner developed very quickly, which indicates both serious flaws in the institutional environment and the presence of potentially attractive assets, for which a serious struggle unfolded (Woodruff, 2003). In fairness, we note<sup>5</sup> The average share of ownership of the largest owner in open companies is almost 68%, and Russia is only ninth with 69% of ownership, but, remarkably, it has become the leader in terms of the share of firms that declined to answer - almost 12% (with an average share of for a sample of 5%).

### **3. Dynamics of ownership concentration: evidence of monitoring**

To estimate the concentration in this work, we use the division of the sample into three groups of enterprises: with a high, medium or low level of concentration.<sup>6</sup>... We call the level of concentration high when there is an owner (a consolidated group of owners) who owns more than half of the shares (shares) of the company. The average level is defined as the fact that the largest owner (one person or coalition) has a blocking block of shares or units (over 25, but not more than 50%). A low level of concentration was observed when both ques-

tions were answered in the negative (there is no owner of at least a blocking package).

The monitoring data make it possible to assess the tendency of a decrease in the concentration of ownership at a number of enterprises that emerged in the second half of the 2000s. The first round showed that in 2005 a high level was typical for 3/4 of business entities, only 8% were enterprises with a medium concentration level and 16% - with a low one. At the same time, almost 44% of the companies had an owner who was not limited by a second large co-owner. The distribution of objects by concentration level was similar for enterprises of different sizes and types of economic activities, represented or not listed on exchanges.

According to the data of the second round, at the end of the 2000s, the concentration of property decreased (Fig. 2): in 2009, in less than 2/3 of economic societies its level was high, but already in every

Concentration of ownership in Russian industry ...Less than 25% shares **22%** More than 50% of shares + no second major owner More than 50% of shares + presence of a second major owner **25%** **25%** to 50% shares **fourteen%** house of the fifth society - low. As a result, less than 39% of enterprises had a dominant owner, not limited to the second largest owner. Still no significant discrepancies were found in terms of economic activity and business size.

For a correct assessment of the dynamics of concentration, let us compare the enterprises of the panel sample (Table 1). For all business entities, the share of firms with a high level of concentration decreased by more than 6 percentage points, for JSCs the decline was smaller - by 4.4 percentage points. The level of ownership concentration was mainly decreasing at enterprises, where it was high four years ago (Table 2). As a result, in a significant group of business entities - the fifth part - the block of shares or shares in the hands of the largest owner decreased, and in the sixth part - it, on the contrary, increased **7...** Taking into account changes in the conditions of control (transitions of companies within a group with a high concentration), the share of firms that retained the same level of concentration and control decreased to 37%, a drop in the level is typical for 32% of companies, and growth - for 31%.

We emphasize that with the chosen method of assessing the concentration, such survey results can be partly explained not only by the sale of shares or shares to new owners, but also by the clear division of ownership between the owners, who previously represented a single team or coalition.

The distribution of enterprises by concentration dynamics by type of economic activity is illustrated in Fig. 3. The prevalence of estimates in favor of the fall is typical for metallurgy, production of machinery and equipment, wood products, electronic and optical equipment. An increase in concentration prevailed in three industries, and the balance of estimates in food production was zero. It is possible that the industries are still at different stages of overcoming the shocks of reforms and privatization of the 1990s, the completion of a radical market restructuring of business. Enterprises that are less attractive to investors continue the process of concentration of ownership and control, which has already been completed for the leaders of adaptation.

How could external corporate control mechanisms have influenced these dynamics? As for the stock market, then

\* The numerator contains data on JSC, in the denominator - on JSC and LLC. Food production Textile and clothing production Wood processing and production of wood products Chemical production Metallurgical production and production of metal products Electrical production □, electronic and optical equipment Manufacture of vehicles and equipment Manufacture of machinery and equipment 0% 20% 40% 60% 80% 100% The concentration level has dropped The concentration level has not changed The concentration level has increased among firms whose stocks or bonds are listed on stock exchanges (less than 9% of the sample), more than 42% reduced the concentration level versus less than 18% of non-tradable companies. We measured transactions in the markets of corporate control by the fact of the change of the main owners during 2005-2008. According to the second round, in 2005-2008. they were replaced by a little more than 23% of business entities, that is, on average 6% annually - according to a panel sample.

Participation in corporate control transactions led to a higher concentration of ownership in 2009, although it occurred against the background of its more stable level (Table 3). The relationship between the level of concentration and the emergence of new owners is linear: at the highest concentration (and in the absence of another center of control), almost 29% of objects previously went through control transactions, while the presence of a second owner and the average level lowered this share to 23%. Only 17% of enterprises with a low level of control have previously changed owners. At the same time, it was the firms that did not have a change of ownership that were characterized by a more dynamic change in concentration, both downward and upward. For the companies that retained the main owners, the share of objects with a drop in concentration was 22%, which is one and a half times more.

A special form of control is corporate integration: being in a group of companies makes an enterprise dependent on the management company and its owners, the decisions they make, and the distribution of powers within the group. According to our data, the concentration decreased by 21% and increased by 19% for independent enterprises. At the same time, the enterprises belonging to the group of companies were distinguished by a more stable state: here the decline was typical for 17% of firms, and growth - for 14%. At the same time, the largest tendency towards a decrease in concentration was characteristic of management companies, more than 27% of them lowered the level of concentration (versus less than 15% of ordinary members of the groups). However, all these discrepancies in the estimates of the dynamics were not statistically significant even at the 10% level.

Thus, the concentration of ownership remains high, but its limits, apparently, have been reached. In the second half of the 2000s, many companies began a process of falling concentration, which took place in some industries and is more characteristic of established business owners who have owned it for more than four years.

#### **4. Empirical analysis**

Empirical studies of the level of concentration of firms in transition economies on the same aggregates revealed its positive dynamics for many years after privatization. At the same time, concentration processes were associated with weak protection of property rights in transition economies (in this regard, Russia was among the "leaders"), peculiarities of legal systems, the need for stricter monitoring of managers' activities, as well as the presence of private benefits of control from the expropriation of minority shareholders and the possibility of unimpeded withdrawal assets (typical for Russia up to the financial crisis of 1998) (Aukutsionek et al., 2009; Grosfeld, Hashi, 2007; Kapelyushnikov, Demina, 2005; La Porta et al., 1998, 1999; Sprenger, 2009).

This section presents a study of both external and underlying interests and actions of company owners, factors that could contribute to the identified differentiation in the dynamics of concentration of ownership in industrial enterprises. In this context, the work (Grosfeld, Hashi, 2007) was especially useful; it analyzed the factors that determine the dynamics of concentration in companies in Poland and the Czech Republic.

We formulated a number of hypotheses about the influence of business behavioral characteristics on concentration dynamics, based on theoretical foundations, empirical results and earlier observations of Russian firms.

To test hypotheses, two types of selection models were used: binary logistic and ordinal probit regression. In the first case, the dependent variable is the variable that takes the value "1" when the enterprise moves to a group with a lower level of ownership concentration and "0" - when the position is maintained or when it moves to a group with a higher level. In the second case, the dependent variable takes three values: "3" - decrease, "2" - stability, "1" - increase in concentration eight... The explanatory variables and specifications are identical for both cases.

The control variables are the size of the business (the logarithm of the number of employees), belonging to one of the types of economic activity (basic category - production of machinery and equipment), organizational and legal form (basic category - LLC). Industry affiliation, as we have seen, can be an independent factor in the multidirectional dynamics of ownership concentration. In terms of size, according to our observations, in the first years after privatization, there was usually a low concentration of ownership in larger enterprises, although by the early 2000s these differences had disappeared (Russian Corporation, 2007), and this is most likely due to the dominant impact of the institutional environment.

Descriptive statistics for the independent variables are presented in Table. 4. Our assumptions are confirmed by paired distributions for the fact of the presence of the company's securities on stock exchanges, its ownership structure, the presence of a competitive environment, as well as the improvement of organizational structures. Although the differences for eight types of activity turned out to be insignificant, the spread was more than 20 pp: the drop in concentration is most typical for metallurgy (32%), and the least for textile and clothing production (11%).

The hypotheses were tested on a sample of business entities with different specifications. The basic model M0 was preliminarily calculated, which characterizes the contribution of exclusively the main characteristics of the business (size, industry, organizational and legal form and level of competition). Model M1 reflects behavioral characteristics (investment behavior and entry into the stock market), both indicators of restructuring are added to the M2 model, and the external factor of the firm's work in a competitive environment is added to M3. These models did not take into account the influence of the industry affiliation of the business; industry dummies are included in the M4 – M6 models.

The results for binary regression (see Appendix, Table A1) show that the M0 model is insignificant, it did not allow to improve the prediction of the dependent variable. Models M1 – M6 improved the distribution forecast by 3–5

pp. The most significant positive impact (an increase in the chances of a fall in concentration by 5-7 times) was consistently exerted by the fact of the presence of the company's securities on stock exchanges.<sup>nine...</sup> The negative impact of the size of holdings of Russian investors was also consistently observed. However, the exclusion of this variable from the specifications made the positive effect of the share of foreign investors' participation significant (at the level of up to 5%) with practically no change in the coefficients for other variables and their significance (with a slight deterioration in the parameters of the models).

The expected impact of investment behavior was not confirmed: the role of past investment activity in 2005–2008 was not revealed. On the contrary, the negative impact of investment plans for the coming year was relatively stable. But, as expected, the fact that the firm operates in a competitive environment turned out to be positive.

The control of industries did not affect the role of the independent variables. In the binary model (as opposed to the ordinal regression), a certain negative role of belonging to closed companies manifested itself, and among industries - an unstable positive role of belonging to metallurgical production only in the M6 model (at the level of 0.095).

For ordinal probit models, similar results were obtained (see Appendix, Table A2). A model similar to the baseline was not significant. In specifications without industry control, the entry of companies into groups with declining or constant concentration was facilitated by the presence of securities on stock exchanges, the share of capital in the hands of foreign investors, the presence of a competitive environment, while investment plans and the size of ownership of Russian investors were discouraged. The control of industries did not change the results, adding to the number of significant belonging to the textile and clothing industry and the production of vehicles. The role of the organizational form was nowhere to be seen.

To assess the stability of the results obtained, the M0 – M6 models of ordinal regression were calculated, in which the dependent variable could take five values:

- 1) a strong decrease in concentration (transition from a group with a high concentration to a group with a low one);
- 2) decline (transition from the high / medium concentration groups to the medium / low concentration group);
- 3) stability;
- 4) growth (transition from low / medium concentration groups to medium / high concentration groups);

5) noticeable growth (transition from a group with a low concentration to a group with a high concentration)ten...

Calculations showed that all independent variables, including dummy variables for the same industries, retained the signs of influence, close values of the coefficients and the level of their significance (while in some specifications the significance of the influence of the investment planning variable was already 5%).

Thus, it was possible to identify a sustained positive impact of market conditions on incentives to reduce concentration, as well as the perceived influence of Russian and foreign co-owners. Hypotheses about the role of investment activity and business restructuring have not been confirmed. 5. Conclusion: discussion of the analysis results

A specific feature of the ownership structure that developed back in the late 1990s in Russia was a very high concentration of capital, which allowed large owners to control the management bodies of the company and directly participate in executive management. But the 2000s were distinguished not only by economic recovery, but also by a gradual improvement in the quality of institutions and corporate governance practices, and by an increase in demand from private business for its instruments. On the one hand, the processes of development of institutions against the background of a favorable economic situation contributed to a change in property relations and the use of the stock market, on the other hand, there was also a feedback: these changes, one way or another, pushed for the improvement of internal corporate mechanisms in companies, thereby somewhat increasing protection shareholders.

The study for the first time revealed signs of a decrease in the concentration of ownership at Russian manufacturing enterprises. The tendency for the concentration of ownership to fall was caused by the listing of companies' securities on stock exchanges, operation in a competitive market, as well as a higher share of capital in the hands of foreign owners. The level of concentration ceases to be the same, there is a differentiation of its dynamics at different enterprises, although no stable trends have been identified in the sectoral context. It is possible that dispersed ownership is no longer so much a signal of the poor state of the enterprise and weak restructuring (as various studies have shown until the mid-2000s), as the result of deliberate steps by the dominant owners of a developing business, because they more often reduced the level of company concentration.

At the same time, a close relationship between the dynamics of concentration and the propensity to invest has not yet manifested itself, and the fact of planning investments was preceded by a trend of increasing concentration,

which to a certain extent agrees with the hypothesis of Grosfeld and Hashi (Grosfeld, Hashi, 2007) about an active investment policy. But it is possible that our result is associated with the shortcomings of the indicators of investment behavior used. The analysis can be developed, for example, by taking into account external and alternative sources of investment to the stock market, first of all, bank loans; it would also be worthwhile to estimate the scale of investment using a quantitative variable.

No restructuring role found. Previous studies usually focused on the need for systemic restructuring. It is possible that the period of painful post-reform adaptation of business to market conditions is over. The current changes are taking place in the normal work of top management, thus not requiring a rigid centralization of power in the company. Another explanation may follow from incentives to diversify investments, when owners will prefer other profitable assets instead of serious investments in an enterprise whose products are already in demand in conditions of dynamic economic growth.

Changing the capital structure is always a fundamental decision of the owners. The actions of large owners may reflect the fact that they are able to control the business without fear of other small owners, at a slightly lower level of concentration than was necessary in the 1990s. In addition, it became clear that it was inappropriate to freeze funds in excess blocks of shares, since economic growth provided other, more efficient investment opportunities: the markets of mergers and acquisitions, stock exchanges. The processes of deconcentration, characteristic, as we have seen, of a fifth of the enterprises in the sample, were the result of the evolution of various motives of owners associated with the diversification of their investments. In addition to the motives for maximizing property income,

In addition, the crisis could become an alternative to evolutionary changes, an incentive - albeit forced - to abandon part of the business. The business publications gave examples of the sale of blocks of shares in enterprises, but the enterprises were often sold as a whole. According to monitoring data, this shock effect is not confirmed. When evaluating 19 main measures aimed at overcoming the consequences of the crisis, less than 6% of firms resorted to the sale of enterprise assets. This measure took the last place among the evaluated ones. And the connection between the sale of assets and the tendency to decrease in concentration was not revealed; on the contrary, the sale was twice as likely to be observed among firms with a stable or growing level of concentration. True, the crisis could have created incentives for a clearer division of ownership be-

tween previously consolidated owners, contributing to the disintegration of their coalition and the division of spheres of control.

However, one should not ignore the indirect impact of the crisis, which is associated with the identified factors - it creates incentives to develop corporate governance. Of course, the crisis removed the motives of investment expansion from the agenda and negatively affected corporate governance, making spending on it one of the first items of savings (ModernCorporateGovernance, 2010). There was also a certain discrediting of the IPO idea. In addition, the Russian government has implemented a number of protectionist measures that have effectively reduced the severity of competition with foreign manufacturers. It is worth mentioning the decrease in the flow of foreign direct investment in 2009 by almost 40% compared to the previous year (the volume of capital contributions also decreased by half). Thus, there was a partial overlap of the channel for importing corporate governance standards, and their development in companies stopped. The risks of infringement of the property rights of large shareholders in the sale of part of the shares increased, slowing down the observed processes of falling concentration.

Owners' motives should also be taken into account when assessing the relationship between concentration dynamics and the investment process. On the example of large companies, it has become widely known that when their securities are placed on stock exchanges, the proceeds often go into the pocket of the leading shareholder for his other purposes and are not returned to the issuing company, so there is no connection with investing in it. At the same time, the availability of borrowed funds is associated with the degree of the bank's confidence in the borrowing company and the majority owner, and the presence of personal relations. It is not excluded that a company with a key owner - "owner" can rather count on loans.

The results need a deeper understanding. Of course, it is advisable to conduct a quantitative analysis, include new factors in the models and test the corresponding hypotheses. At the same time, formalized surveys inevitably include "noise" caused by the mismatch between the structures of formal ownership (offshore companies, affiliated firms, nominees) and de facto control. These discrepancies are also associated with the widespread occurrence in Russian firms of the so-called "partner business" - coalitions of owners, which in dynamics, especially in crisis situations, turn out to be unstable. Therefore, it is fundamentally important to provide a qualitative explanation of the trend, to identify the motives of the owners, including post-crisis ones, whose actions pushed to reduce the concentration of capital. A formalized survey does not allow this.

**Reference:**

- Guriev S.M., Lazareva O.V., Rachinsky A.A. et al. (2003): Corporate governance in the Russian industry // Series "Scientific reports: an independent economic analysis". No. 149. M.: MONF and CEFIR.
- Dolgopyatova T.G., Ivasaki I., Yakovlev A.A. (2009): Russian business 20 years later: the path from a socialist enterprise to a market firm // World of Russia. T. XIII. No. 4.
- Drobyshevsky S., Radygin A., Gorshunov I. et al. (2003): Investment behavior of Russian enterprises. Scientific works of the IET No. 65. M.: IET.
- Transparency Survey (2006): Transparency Survey of Russian Companies in 2006: Modest Progress Against the Backdrop of Global IPO Desire. M.: Standard & Poorz.
- Kapelyushnikov R. (2006): Concentration of ownership in the corporate governance system: evolution of perceptions // Russian Management Journal. T. 4.No. 1.
- Kapelyushnikov R., Demina N. (2005): Influence of property characteristics on the results of economic activity of Russian industrial enterprises // Problems of Economics. No. 2.
- National Report (2008): National Corporate Governance Report. Issue 1 / Ed. A.E. Shastitko. M.: National Council for Corporate Governance.
- National Report (2009): National Corporate Governance Report. Issue 2 / Ed. A.E. Shastitko. M.: National Council for Corporate Governance.
- Pape Ya.Sh., Galukhina Ya.S. (2009): Russian Big Business: The First 15 Years. Economic Chronicles 1993-2008 Moscow: Publishing House of the State University Higher School of Economics.
- Board portrait (2007): A portrait of the board of directors of a Russian company as a reflection of the concentrated ownership structure of companies and obstacles to the development of corporate governance. M.: Standard & Poorz.
- Enterprises and Markets (2010): Enterprises and Markets 2005-2009: Outcomes of Two Rounds of the Russian Manufacturing Industry Survey. Report at the XI International Scientific Conference of the State University Higher School of Economics / Ed. B. Kuznetsova. Moscow: Ed. House of the State University Higher School of Economics.
- Development of demand (2003): Development of demand for legal regulation of corporate governance in the private sector // Series "Scientific reports: an independent economic analysis". № 148. M.: MONF and ANO "Projects for the Future".

Structural Changes (2004): Structural Changes in Russian Industry / Ed. E.G. Yasin. Moscow: Publishing House of the State University Higher School of Economics.

**Aukutsionek S., Dyomina N., Kapelyushnikov R.** (2009): Ownership Structure of Russian Industrial Enterprises in 2009 // Russian Economic Barometer. Vol. Xviii. No. 3.

**Blasi J., Kroumova M., Kruse D.** (1997): Kremlin Capitalism: the Privatization of the Russian Economy. Ithaca: Cornell University Press.

**Grosfeld I., Hashi I.** (2007): Changes in Ownership Concentration in Mass Privatized Firms: Evidence from Poland and the Czech Republic // Corporate Governance - An International Rev. Vol. 15. No. 4. P. 520-534.

**La Porta R., Lopez-de-Silanes F., Shleifer A.** (1998): Law and Finance // Journal of Political economy. Vol. 106. P. 1113-1155.

**La Porta R., Lopez-de-Silanes F., Shleifer A.** (1999): Corporate Ownership around the World // Journal of Finance. Vol. 54. P. 471-517.

Modern Corporate Governance (2010): Modern Corporate Governance in Russia as Seen by Foreign Businessmen and Experts. Findings of the survey held by National Council on Corporate Governance and Russo-British Chamber of Commerce. Moscow.

Organization (2009): Organization and Development of Russian Business Organization and Development of Russian Business: A Firm-level Analysis / Eds. by T. Dolgopyatova, I. Iwasaki, A. Yakovlev. Basingstoke: Palgrave MacMillan.

**Sprenger K.** (2009): The Choice of Ownership Structure: Evidence from Russian Mass Privatization. Preprint WP9 / 2009/02. M.: GU HSE.

**Stiglitz J.** (1999): Quis custodiet ipsos custodes? Corporate governance failures in the transition, The paper presented at the World Bank's Annual Conference on Development Economics (ABCDE), Paris, June.

**Woodruff D.** (2003): Property Rights in Context: Privatization's Legacy for Corporate Legality in Poland and Russia. Preprint WP1 / 2003/01. M.: GU HSE.

**DRAFT LAW "ON EDUCATION": ITERATION No. 2**

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*Muzichuk V.Yu.*

*IE RAS, Moscow*

E-mail: muzichuk@mail.ru

*On December 1, 2010, a new version of the draft federal law "On Education" was published... According to the legislator's plan, the discussion will last for two months - until February 1, 2011. It should be noted that public discussion of the draft law "On Education" began in May 2010, when the Ministry of Education and Science of Russia published on its website the first edition of the said draft law in excess of 400 pages ...*

The main complaints about the form of the original bill were its very impressive size, as well as the difficulties of perceiving the text itself due to the heavy official language with which it was written. In terms of its stylistic features, the draft law was more like a "instruction manual" than a document laying down strategic guidelines for the development of the Russian education system.

In terms of the content of the draft law, the changes concerning the elimination of primary vocational education were of utmost concern; transformation of the system of higher education: giving the college the status of an educational organization of higher education, introducing postgraduate studies into the system of higher education in terms of training scientific and pedagogical personnel and abolishing the concept of "postgraduate education" as such; the absence in the draft law of a norm regarding small schools, the closure of which by local governments is possible only by decision of the village gathering; the disenfranchised, derogatory status of the teacher; the lack of state guarantees regarding the financing of the education system, etc. In total, during the summer-autumn discussion, the Ministry of Education and Science of Russia received over 1000 comments and amendments, which, as promised,

Detailed acquaintance with the text of the amended draft law surpassed the worst fears. The bill was cut to such an extent, and very carelessly, that it hardly outlines the main contours of the reformed education system. As a result, it will be necessary to develop and approve a colossal number of normative legal acts to the basic law. The danger is that such a pipeline of bylaws can be difficult to track and verify. Their lion's share will be adopted in the regions and at the local level, so regional and local officials will have the opportunity to interpret certain

provisions of the federal law in multiple ways. Our history has repeatedly demonstrated examples of how by-laws crossed out the content of the law itself.

Without pretending to the full coverage of the proposed innovations, let us dwell in more detail on the main legislative innovations that have caused a great public outcry.

The updated version of the draft law "On Education" contains 19 chapters of 241 pages. In terms of the style of the document, it should be noted that "legal casuistry" still prevails over the main content of the law, there is a terminological overload of the text, there is a conceptual and substantive discrepancy between the chapters of the bill. A law that applies to everyone and everyone, designed to regulate one of the most important spheres of social structure, should be written in a language that is as understandable as possible for the general population.

First of all, it should be noted that the draft law does not contain norms on the content of education, referring readers to state educational standards.<sup>2</sup>... The law declares "the establishment by the state of mandatory minimum requirements for the conditions of the educational process, the level and quality of education" (subparagraph 13 of paragraph 2 of article 3). However, in the conditions of a chronic deficit of regional and local budgets, especially in relation to socially significant sectors, it is necessary that these "minimum requirements" set a high bar for the advanced development of the domestic education system.

The elimination of the initial level of vocational education is of particular concern. The authors of the bill note that this is a matter of terminology. Allegedly, primary vocational education (VET) will enter the system of secondary vocational education (SVE) as its initial stage - the training of qualified workers (at the second stage of VET, mid-level specialists will be trained).

By canceling the level of primary vocational education, the authors of the draft law forget about its social function. By the way, the vocational school contingent is a certain social section of Russian society, ignoring which is fraught with increased social risks.

In paragraph 5 of Art. 7 of the bill states that "the basic educational programs of secondary vocational education can be implemented by higher education organizations." Is there no danger in this formulation that higher education will be reduced to the level of secondary vocational education? How can we not recall the recent statement of the President of the Russian Federation that the teaching staff of universities should teach in technical schools?<sup>3</sup>

The higher education system will undergo significant changes. Higher education will represent a three-tier structure (in fact, four-tier): bachelor's degree

(qualification "Bachelor"), specialist training ("Specialist"), master's degree ("Master") and training of scientific and pedagogical personnel (after graduation ( Postgraduate studies) - assignment of the qualification "Higher school teacher" or "Researcher", and after the defense of the thesis - the diploma of the candidate of sciences). Postgraduate studies (postgraduate studies) will be relegated from the level of postgraduate education to the level of higher education in terms of training scientific and pedagogical personnel. It should be noted that this innovation makes sense only if the academic degrees of candidate and doctor of science are awarded to people whose professional interests lie in the field of science and education. There was no place at all for doctoral studies in the new version of the bill. The point is that it will be excluded from the educational process, falling under the jurisdiction of the law on science.

In accordance with the bill, a college will be equated to institutions of higher education, along with an institute and a university (clause 2, article 113). In colleges, they will teach in applied bachelor's programs, in institutes - in applied and academic bachelor's programs, as well as in specialist training programs, at universities - in programs of all levels of higher education, including training scientific and pedagogical personnel and conducting fundamental and applied scientific research.

At the same time, "colleges, institutes and their branches have the right to carry out fundamental and applied scientific research mainly in one area of science or culture" (clause 4 of Art. 113). Without in any way belittling the need for the development of university science, it is still important to clearly understand that teaching and research activities are not the same thing. A significant lag in the salary of teaching staff from the average salary in the economy over the past 20 years since the acquisition of Russian sovereignty forced teachers to increase the lecture load, as a result of which old knowledge was transmitted with a catastrophic lack of time to update it. The latter, in turn, is the basis of research activities. The result was not slow to show itself - the low quality of teaching and the lack of conditions for research activities characterize the current state of the domestic higher education. Attention is drawn to the fact that, declaring the need to integrate science and education, the draft law bypasses "dead silence" the activities of the Russian Academy of Sciences.

Organizations of additional professional education will include academies, institutes of professional qualifications and centers, therefore, higher education organizations using the word "academy" in their name will be forced to re-register as institutes or universities.

It should be emphasized that the draft law lacks mechanisms for financing and preferential taxation in the education system. Moreover, one gets the impression that the implementation of state policy in the field of education entirely depends on the provisions of the Budget Code of the Russian Federation. Instead of setting in the law the minimum standard for financing education (as was the case in the early 1990s), at least which should finance not so much the functioning, but above all the advanced development of the domestic education system, the draft law, on the contrary, sets the upper threshold values in the formulations with the following content: "financial support ... is carried out within the budgetary allocations provided for in the budget of the constituent entity of the Russian Federation" (clause 12, article 12).

At best, Russian education will continue to receive funding "from what has been achieved" rather than based on the actual needs of the industry. In the light of the provisions of Federal Law No. 83-FZ of May 8, 2010 "On Amendments to Certain Legislative Acts of the Russian Federation in Connection with the Improvement of the Legal Status of State (Municipal) Institutions", will entail a real decrease in funding.

It should be noted in the draft law a pronounced tendency to change the priorities in the implementation of state policy in the field of education: the priority of the development of higher education is giving way to secondary vocational education.

In general, one gets the impression that public discussion of the draft law "On Education" is a necessary, albeit annoying, formality that creates the illusion of public participation in the adoption of major government decisions.

In conclusion, it should be noted that the second edition of the draft law "On Education" was, on the whole, worse than the original version. Its two-fold reduction only launches the mechanism for the adoption of a huge array of by-laws, which creates ample opportunities for the arbitrariness of officials.

The draft law "On Education", designed to lay the strategic guidelines for the development of the domestic education system, puts at the forefront not the formation of the foundations for the advanced development of education, but the provisions of the Budget Code of the Russian Federation.

The draft law does not contain clearly formulated legal norms in which the development of education is recognized as the sphere of responsibility of the state.

Attention is drawn to the fact that the draft law does not contain a substantive component of the educational process, since the main attention here is fo-

cused on the organizational and legal foundations of the functioning of educational organizations.

The bill does not spell out state guarantees for financing the domestic education system, as well as mechanisms for preferential taxation of educational organizations.

To restore respect and understanding of the high social significance of the professions of educator, teacher, educator, researcher

it is impossible without fixing in the law a legal norm, according to which the wages of these categories of workers should not be lower than the level of the average wages in the economy, which, unfortunately, is absent in the text of the draft law.

Critical comments from the public regarding the cancellation of the levels of primary vocational education and postgraduate education, changes in the structure of higher education in the new version of the bill were not taken into account. Russia is one of the few countries in the world where fundamental research is carried out in all major areas of science. Traditionally, a significant part of such research is concentrated in the Russian Academy of Sciences. The latter, according to state statistics for 2008, includes 466 scientific organizations (in Russia as a whole - 3666), which employ 93.7 thousand people (in Russia - 761.2 thousand), including 54.7 thousand researchers (in Russia - 375.8 thousand). The qualification level of the Academy scientists is significantly higher than in other organizations conducting research and development. So, if in 2008

The personnel potential of the Russian Academy of Sciences is distributed as follows by fields of science: natural sciences account for 72.6% of all researchers, technical sciences - 12.8, medical - 0.4, agricultural - 0.5, public - 6.0, humanitarian - 7, 6%.

Approximately 20% of all funds allocated by the state for financing the RAS are distributed by the Presidium of the RAS and branches on a competitive basis to finance large research programs, which, as a rule, are of an interdisciplinary nature. Basic and program funding is reported to the institutions according to estimates.

In recent years, there has been an active discussion in the country about how the current forms of organization of fundamental science meet modern requirements. They revolve around the following basic questions.

What kind of fundamental science does Russia need?

How should the relationship between science and higher education be built?

Who is the main subject of scientific activity: an institute or a laboratory?

How to evaluate the effectiveness of fundamental research and what is the role of formal indicators (number of publications, citation indices, etc.) and expert assessments in this?

Should funding volumes be linked to formal indicators?

What is the best way to fund basic scientific research: by grants or by an estimate?

The generalized position of the critics of the Russian Academy of Sciences can be presented as follows. The quality of the scientific product is evidenced by the citation index and the impact factor of those scientific journals in which the scientific article was published.

Let's start with the question of the effectiveness of scientific research within the framework of the RAS. We emphasize right away that, in our opinion, any formal indicators are nothing more than raw materials for a qualified expert assessment.

Based on materials from Essential Science Indicators Russian science as a whole in terms of such an indicator as the number of publications in 1996–2005. by 1 million dollars at purchasing power parity ranked 22nd (16.6 items). At the same time, RAS published 70.7 articles and was in first place.

The situation is similar with the citation rate. In Russian science as a whole, 58.1 citations (33rd place) accounted for \$ 1 million in purchasing power expenditures, while in the Russian Academy of Sciences - 269.5 citations (4th place). Finally, for the period 1998–2008. (in comparison with 1997–2007) the citation rate in Russian science increased by 7%, and in the Russian Academy of Sciences - by 16%.

We categorically disagree with the fact that Russian science today does not have the necessary human resources to implement ambitious plans. It is a big mistake to limit it to the circle of researchers who have publications in foreign journals with a high impact factor. Among other things, it should be borne in mind that scientists of the older generation were formed in different historical conditions, and it is at least unreasonable to ignore their scientific potential on the basis of such indicators.

The Russian Academy of Sciences is open for international cooperation and is ready to actively use its most advanced forms, including recruiting foreign scientists (including representatives of the Russian scientific diaspora) to work

in our institutes. However, our principled position is that the conditions of employment should depend not on the citizenship of the scientist, but on his qualifications, as well as the general rules in force in the country.

We do not share the point of view according to which the key subjects of scientific activity are laboratories, therefore, funding should be allocated between them on a grant basis. The RAS institutes are not economic superstructures over their laboratories, but full-fledged scientific structures that ensure the development of major scientific problems. Our experience shows that academic institutions are effective participants in cooperation (both among themselves and with non-academic research centers), thanks to which there is a consolidation of forces around breakthrough areas of technological progress, and important government projects are being implemented.

We believe that the existing system of basic funding for RAS institutes and distribution of funds within the Academy gives all the opportunities for the scientific community to independently determine research priorities. Of course, this does not mean that we are generally against the system of grant funding. In our opinion, it gives the best results when it is used to select potentially promising projects proposed by individual scientists or their small groups.

The RAS considers it important to restore the level of fundamental research in higher education, which fell sharply in the 1990s. At the same time, we are convinced that an attempt to solve this problem by limiting the funding of the RAS would be a big mistake. And we think that plans to transfer all fundamental research to universities are simply dangerous for the fate of Russian science. Carefully balanced development of fundamental science in the academic sector and higher education, preservation of various channels and mechanisms for financing scientific creativity will create optimal conditions for research activities.

Thus, we are convinced that the academic form of organizing science, which has developed in Russia for almost centuries, fully retains its viability. However, it does not follow from this that we do not see serious internal problems and challenges that academic science faces today and which make the task of its modernization more than urgent.

Problem number one is the unfavorable age structure of scientific personnel, which was formed as a result of the catastrophically low funding for science in the 1990s. At the end of 2008, the age structure of scientific personnel was as follows: researchers under 29 - 13.5%; 30–39 years old - 14.8; 40–49 years old - 15.5; 50-59 years old - 24.1; over 60 years - 32%. The obvious "demographic hole" in the contingent of middle-aged scientists poses a difficult task for us - to

actively involve young people in science and create conditions for the transfer of experience to them by colleagues from the older generation.

Something that can be done here. Thanks to a special project implemented in 2006–2008, the salaries of researchers from budgetary sources have increased fivefold. The average monthly salary of R&D personnel in the Russian Federation was 19,263 rubles in 2009. per month, and at the RAS - 26,963 rubles. per month. As a result, a queue of young scientists (mainly graduates of postgraduate studies from academic institutions) has emerged who associate their career aspirations with work in academic science. That is why the decision made by the government on the initiative of the President of the country to allocate funds to the Russian Academy of Sciences in 2011 to finance 1000 rates for young scientists is of great importance to us. Finally, it should be noted that

The second group of problems is connected with the fact that the provision of our scientists with modern equipment and instruments is still far from ideal. This is the problem of all Russian science. At the end of 2008, the technical equipment of one researcher in the Russian Federation was only 40 thousand rubles, and for a researcher of the Russian Academy of Sciences - 52.3 thousand rubles. Unfortunately, the solution to this problem has seriously slowed down due to the global financial crisis over the past two years. As a result, today almost three quarters of the budgetary funds allocated by the RAS are spent on paying salaries.

The third group of problems is associated with making the structure of academic organizations more flexible, strengthening competitive principles in planning scientific research and allocating budget funds.

It must be admitted that today the balance between the stability and flexibility of the structure of RAS organizations is violated. The liquidation of scientific structures (laboratories, research institutes) that have lost their scientific potential is difficult and takes place very slowly. This is partly due to institutional reasons beyond the direct control of the Academy. As an example, I will cite the fact that the bulk of the staff of academic institutions still has perpetual employment contracts, which sharply complicate the process of reasonable renewal of scientific personnel.

However, there are problems on our side as well. It is necessary to make a number of changes to the current procedure for the formation of plans for scientific research and assessment of their results. We associate increased competition in the selection of research projects to be funded and an informal approach to assessing their results with a qualitative increase in the level of expert activity within the Academy. Of course, we will track formal performance indicators,

but we will only use them as a supplementary material for expert assessments. Our skepticism about the idea of directly linking the achieved levels of such indicators with the volume of funding remains unchanged.

The fourth group of questions is related to the activities of our institutes for the commercialization of applied results accompanying fundamental research. One of the aspects of this problem concerns a clear delineation of the directions of the use of financial flows that lead to our organizations on the budget and commercial lines. A particular case of this problem is the procedure for the use of grants provided to our scientists from non-academic sources. We consider it correct to switch to the practice accepted in the world, when such grants cannot be used for the salary of the grantee, but are called upon to ensure the acquisition of the necessary equipment and devices, as well as the involvement of students and graduate students. In this case, the submission of applications for grants on planned topics by our researchers will be quite justified. This is our position. But it can only be implemented if the donor foundations amend their grant regulations accordingly.

The second, larger area of activity for the commercialization of the applied results of our institutes is associated with the creation of the so-called “innovation belt of the Russian Academy of Sciences”. We propose such a mechanism for solving this problem. Within the Academy, a 100% state-owned holding company is being created, which, if necessary, establishes subsidiaries for the implementation of specific innovative projects based on the applied results of academic institutions. Such a construction translates the process of innovation into a natural commercial mode, and therefore allows attracting private capital for the implementation of large-scale projects. Among other things, if the government accepted this proposal, the Academy would receive an additional source of funding - dividends paid by the holding company.

And in conclusion, let us note the attitude of the Russian Academy of Sciences to international scientific cooperation. We consider the idea of a transition to a continuous external examination of the scientific activities of our institutes to be pure “nozdrevshchina”. But we understand very well that science is international in its essence. That is why RAS actively cooperates with all major scientific organizations in the world, being a notable participant in international scientific exchanges.

**FRANKFURT SCHOOL OF FINANCE AND MANAGEMENT**

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Libman A.M.

*Institute of Economics RAS,  
Frankfurt am Main, Moscow*

Email: [ameram@yandex.ru](mailto:ameram@yandex.ru)

*German economics - from national to globalThe development of German economic science over the past century and a half is, in a sense, a typical example of the evolution of the communities of economists in European countries, but at the same time it differs in many respects from them. At the end of the XIX century. Germany was a leader in the institutionalization of economic science: suffice it to recall that the American Economic Association was created in many ways "in the image and likeness" of the German Union for Social Policy. At the same time, German scientists enjoyed significant international recognition.*

After World War II, the German scientific community, on the other hand, was cut off from world economic science (the center of which was the United States): partly as a result of the remaining elements of the influence of the German historical school (primarily in the field of methodology (Barkai, 1996), and partly as a result of organizational and institutional characteristics (Hesse, 2005) . This isolation found expression, firstly, in the content of the research of German economists, their methodology and the style of theorizing, and secondly, in the intensity of information exchange between Germany<sup>1</sup> and the "big world". German economists rarely published in international peer-reviewed journals - in general, the small scale of the German community of economists (which will be discussed below) fundamentally prevented the formation of any large "magazine industry". As a result, monographs, yearbooks and collections of scientific papers have become the dominant form of publication - almost always in German. Undertaken from time to timenor attempts to publish collections in English translation, as a rule, attracted significant interest.

However, over the past decades, German science has undergone a fundamental shift, and today it is possible to speak about the "national specificity" of German science - content (Freyletal., 2007) and organizational - only in the past tense. The German scientific community is fully integrated into the global system (Raucher, Ursprung, 2008). Even the few magazines that had existed in Germany began to publish in English: perhaps the most striking example is the transformation of the Zeitschrift fuer die gesamte Staatswissenschaft, which had

more than a century of history, into the Journal of Institutional and Theoretical Economics<sup>2</sup>... New magazines (German Economic Review, Kyklos) in the German-speaking space are usually published in English from the very beginning. Permanent journals in German (Perspektiven der Wirtschaftspolitik, Zeitschrift für Wirtschaftspolitik) focus on applied policy issues and "specific" discussions of interest only to the German community.

However, even English-language journals published in Germany (German Economic Review) meet limited interest from German researchers, who have almost completely accepted the existing hierarchy of journals in the world community.<sup>3</sup>... Monographs and publications in collections of scientific works, which were once the main method of scientific communication twenty years ago, are almost completely "withering away." Even a doctoral dissertation, traditionally carried out in the form of a "book", is today increasingly "cumulative": a collection of three or four articles on similar topics, focused on publication in journals<sup>4</sup>... Today, many young German economists have never published in German, and, moreover, they often do not even teach in German - if in the baccalaureate that emerged in Germany as a result of the Bologna process, many courses are taught in German, then the magistracy, as a rule, is already completely switching to English.

The above observations to some extent confirm the quantitative indicators, among which the most interesting is the publication activity of German scientists in international peer-reviewed journals, which can be considered the best indicator of their international integration. Of course, since the process of qualitative transformation was completed in the second half of the 2000s, then, most likely, the available data underestimate the performance of German economists and, more importantly, the requirements imposed by the community on economists (which sooner or later will "grow" into real publications) ... But some conclusions can still be drawn.

First of all, a number of studies (Kalaizidakis et al., 1999; Kocher, Sutter, 2001; Combes, Linnemer, 2003; Kocher et al., 2006) conduct a comparative analysis of the number and "quality" of international publications by researchers from individual countries.<sup>5</sup>... Other works (Combes, Linnemer, 2003; Kalaitzidakis, 2003; Lubrano et al., 2003) use the same approach to compare the level of individual universities. Here, the results are mostly disappointing: at the beginning of the 2000s (namely, this period was mainly studied in the literature) Germany was noticeably lagging behind English-speaking and many small European countries (and also known for Israel's highly effective results) in terms of the number and quality of international publications. The effect persists even if

the US, with its absolute dominance in economics, is excluded from the analysis. This applies to the publications of both researchers working permanently in Germany and those who have received their doctorates in Germany. The situation in Austria and Switzerland was somewhat better according to separate studies. In addition, as shown in (Hodgson, Rothman, 1999), in 1995. only seven out of more than seven hundred (!) members of the editorial boards of the leading 30 international journals worked in Germany. At the same time, even here one can find some evidence of an improvement in the situation: for example, we are talking about the evolution of universities in the Southwest of Germany in the 2000s (Combes, Linnemer, 2003).

The reasons for this lag (as well as its gradual overcoming) are clearly visible if we turn to the list of journals in which German researchers preferred to publish. As noted in (Combes, Linnemer, 2003), in Germany such for 1971–2000. there were exclusively German-language editions: *Jahrbuecher für Nationaloekonomie und Statistik* (JNS), *Zeitschrift für Wirtschafts- und Sozialwissenschaften*, as well as the *Journal of Institutional and Theoretical Economics* (JITE), which has been translated into English. The top five also includes two magazines on business economics (*Kredit und Kapital* and *Zeitschrift für Betriebswirtschaft*), as well as the more applied magazine *ifo Studien*... According to (Lubrano et al., 2003), for all journals included in the E-JEL database since the early 1970s, Germany has one of the lowest places in Europe in terms of the share of publications in leading publications (11% - less only in Greece , Ireland and Italy - compared with 66% of California universities in the US), but 66% of publications are in “national journals” (more only in France, Italy and Spain). However, already at the end of the 1990s (more precisely, 1993–1999), according to (Wittenhager et al., 2001), the situation changed for the better. Although the leaders in terms of the number of articles with German participation remain *Kyklos*, the *Review of World Economics* (formerly the *Weltwirtschaftliches Archiv*, published in Kiel) and *JITE*, *Zeitschrift für Nationaloekonomie*, but already the fourth and fifth places are occupied by very strong *Economics Letters* and *European Economic Review*, in ninth place - by the *Journal of Economic Behavior and Organization*, and in tenth - by the *Journal of Public Economics*.

Also controversial are the results of works that directly analyze the dynamics of publication activity in Germany and other countries. If, according to estimates (Eichenberger et al., 2000), Germany's position in terms of the array of publications has remained practically unchanged, then the report (Wittenhager et al., 2001) gives a more optimistic picture. Although the share of Germany on

average in publication activity in 1981-1999. remained insignificant, the authors clearly record a constant growth of this indicator in the structure of new publications: from 1.2% in 1981 to 2% in 1989 and 3.3% in 1999. Taking into account the slowness of the academic publication process, the situation looks far from so bad. We abstract from international comparisons and focus on internal dynamics: the changes will turn out to be even more impressive. The study (Beckmann and Schneider, 2009) provides data characterizing the publication activity of German researchers in the 1980s – 2000s. According to this work, until 1987, publications in international journals remained the preserve of a small number of researchers (the distribution is determined by "outstanding values"). Even for later periods, zero is still included in the confidence interval for the average number of points that the average German researcher gains per year. Nevertheless, one can clearly see an improvement in the situation, both on average (the average researcher began to publish, and he is publishing more and more actively), and for outstanding values (the level of which has slightly increased compared to the 1980s). characterizing the publication activity of German researchers in the 1980s – 2000s. According to this work, until 1987, publications in international journals remained the preserve of a small number of researchers (the distribution is determined by "outstanding values"). Even for later periods, zero is still included in the confidence interval for the average number of points that the average German researcher gains per year. Nevertheless, one can clearly see an improvement in the situation, both on average (the average researcher began to publish, and he is publishing more and more actively), and for outstanding values (the level of which has slightly increased compared to the 1980s). characterizing the publication activity of German researchers in the 1980s – 2000s. According to this work, until 1987, publications in international journals remained the preserve of a small number of researchers (the distribution is determined by "outstanding values"). Even for later periods, zero is still included in the confidence interval for the average number of points that the average German researcher gains per year. Nevertheless, one can clearly see an improvement in the situation, both on average (the average researcher began to publish, and he is publishing more and more actively), and for outstanding values (the level of which has slightly increased compared to the 1980s). publications in international journals remained the domain of a small number of researchers (distribution is determined by "outstanding values"). Even for later periods, zero is still included in the confidence interval for the average number of points that the average German researcher gains per year. Nevertheless, one can clearly see an improvement in the situation, both on average (the average

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The growth of publication activity in international journals is also recorded by the data of the work (Graber et al., 2008), which investigates the productivity of individual age cohorts of German scientists. The results show that researchers who later enter the community (become full professors) are significantly more productive. Within the youngest group (professors who received positions in 1997-2006), about 40% of researchers gain about 0.5 points per year (where one point is assigned for an article in the European Economic Review); cohort 1988-1996 receives an average of only 20% per year, the 1979-1987 cohort. - 5%, and the older cohort, which received positions during the boom of new faculties in 1970-1978, publishes practically nothing. The same conclusion is confirmed by the data (Raucher, Ursprung, 2008).

Publications are also becoming an increasingly important feature in the selection of new faculty and researchers. Graber et al. (2008) provide data on the average number of publications by professors who have received a position since 1975 in the year of appointment (again, in terms of an article in the European Economic Review). The analysis revealed a clear trend towards a constant increase in the demand for publications: from less than one in 1975 to about three in 1990 and more than six in 2006 (see also (Schulze et al., 2008), where there is a close result). If we try to forecast the situation for the coming years (after 2010) by discipline, we can expect that in the field of microeconomics and public finance the requirements will reach 10 equivalents of the article in the European Economic Review for the year of appointment.

To summarize, the trend towards integration into the global scientific community is evident. Even if Germany did not become a leader in the global market (frankly, this is hardly possible: in the foreseeable future, the absolute dominance of the United States as a center of economic research is beyond doubt), it, in any case, can be considered an integral part of it.

### Reference

- Dezhina I.G., Dashkeev V.V.** (2008): Are there leading economists in Russia and who are they? M.: IET.
- Azarloglou K., Theoharakis V.** (2003): Diversity in Economics: An Analysis of Journal Quality Perceptions // Journal of the European Econ. Association. Vol. 1. P. 1402-1423.
- Barkai H.** (1996): The Methodenstreit and the Emergence of Mathematical Economics // Eastern Econ. Journal. Vol. 22. P. 1-19.
- Beckmann K., Schneider A.** (2009): The Interaction of Publications and Appointments - New Evidence on Academic Economists in Germany. Helmut Schmidt University Department of Economics Working Paper No. 91 (Hamburg: Helmut Schmidt University).
- Cardoso AR, Guimaraes P., Zimmermann KF** (2010): Trends in Economic Research: An International Perspective // Kyklos. Vol. 63. P. 479-494.
- Combes P.-P., Linnemer L.** (2003): Where are the Economists Who Publish? Publication Concentration and Rankings in Europe Based on Cumulative Publications // Journal of the European Econ. Association. Vol. 1. P. 1250-1308.
- Eichenberger R., Meier U., Arpagaust R.** (2000): Oekonomen, Publikationen und Zitationen: ein europaeisches Vergleich // Perspektiven der Wirtschaftspolitik. Band 1. S. 143-160.
- Frey BS, Humbert S., Schneider F.** (2007): Was denken deutsche Okonomen? Eine empirische Auswertung einer Internetbefragung unter den Mitgliedern des Vereins für Sozialpolitik im Sommer 2006 // Perspektiven der Wirtschaftspolitik. Band 8. S. 359-377.
- Graber M., Launov A., Waelde K.** (2008): Publish or Perish? The Increasing Importance of Publications for Prospective Economics Professors in Austria, Germany and Switzerland // German Econ. Rev. Vol. 9.P. 457–472.
- Hesse J.-O.** (2005): Why Did German Economics Turn to a Mathematical Approach So Late? On the Relationship of Social Change and Scientific Progress. Mimeo (Bremen: EAEPE).
- Hodgson GM, Rothman H.** (1999): The Editors and Authors of Economics Journals: A Case of Institutional Oligopoly? // Econ. Journal. Vol. 109. P. 165-186.
- Kalaitzidakis P., Mamuneas Th. P., Stengos Th.** (1999): European Economics: An Analysis Based on Publications in the Core Journals // European Econ. Rev. Vol. 43. P. 1150-1168.

**Kalaitzidakis P., Mamuneas Th. P., Stengos Th.**(2003): Rankings of Academic Journals and Institutions in Economics // Journal of the European Econ. Association. Vol. 1. P. 1346-1366.

**Kocher MG, Sutter M., Heregger UL** (2004): Die Bedeutung der Zeitschriftenauswahl für die oekonomische Forschung, in: Backes-Gellner P. (ed.): Evaluationen von Bildungsinstitutionen und Konsequenzen. Berlin: Duncker und Humblot. P.101-118.

**Kocher MG, Sutter M.** (2001), The Institutional Concentration of Authors in Top Journals of Economics during the Last Two Decades // Econ. Journal. Vol. 111. P. 405-421.

**Kocher MG, Luptacik M., Sutter M.** (2006): Measuring Productivity of Research in Economics: A Cross-Country Study Using DEA // Socio-Economic Planning Sciences. Vol. 40. P. 314-332.

**Lubrano M., Bauwens L., Kirman A., Protopopescu K.** (2003): Ranking Economics Departments in Europe: A Statistical Approach // Journal of the European Econ. Association. Vol. 1. P. 1367-1401.

**Raucher M., Ursprung HW** (2008): Life Cycle and Cohort Productivity in Economic Research: The Case of Germany // German Econ. Rev. Vol. 9.P. 431–456.

**Schulze GG, Warning S., Wiermann C.** (2008): What and How Long Does It Take to Get Tenure? The Case of Economics and Business Administration in Austria, Germany and Switzerland // German Econ. Rev. Vol. 9. P. 473-505.

**Winterhager M., Schwechheimer H., Weingart P.** (2001): Sichtbarkeit Deutschlands in den internationalen fuehrenden Zeitschriften der Wirtschaftswissenschaften. Bericht an den Wissenschaftsrat und das BMBF (Bielefeld: University of Bielefeld).

**APPLICATION OF ECONOMIC AND MATHEMATICAL METHODS IN STUDYING INFLATION PROCESSES IN AZERBAIJAN:  
SARIMAX MODEL AND EXTENDED  
MODEL OF FOURIER SERIES**

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*Yusifov Murad Yusif oglu*

*Baku State University, doctoral student*

*Email: murad-yusifov-2015@mail.ru*

*Azerbaijan, Baku*

*Tel. Mob. +994506753977*

*In this study, inflation cycles and the forecasting quality of mathematical methods were applied and examined. SARIMAX models and an extended Fourier series model were applied in forecasting inflationary processes. The study identifies the cycles and intensity of inflation. The Fourier series model has been extended with a dummy variable (Extended Fourier Series Model) in order to consider economic shocks in the model.*

*In this study inflation cycle of Azerbaijan and forecasting quality of mathematics methods have been determined and investigated. Model SARIMAX and Extended Fourier series model have been implemented in forecasting the inflationary processes. Fourier series model has been extended by additive dummy variable (EFS model- Extended Fourier series model) in order to consider the economic shocks in the model.*

**Keywords:** Fourier, inflationary processes, forecasting, SARIMAX model

**Keywords:** Fourier series, inflationary processes, forecasting, SARIMAX

### **Introduction...**

According to dialectics, development does not occur as a linear movement, but "spirally". There is also a return to the starting point here. But this return and periodic processes are taking place on new foundations. [1, p.272].

As periodic processes, inflationary processes occur from complex mutual economic events occurring in a dynamic economic system. The relevance of the doctrine of inflationary processes acquires a new quality based on the economic behavior of business entities, and this makes this study more interesting for researchers. In addition, in order to consider economic shocks in the economic model, the Fourier series were extended with a dummy variable.

Previous research in this area.

For the first time, the Fourier series were presented by the French mathematician Joseph Fourier in his treatises "Distribution of heat in solids" in 1807 and "Analytical theory of heat" in 1822 [4, p.125].

Andrea Fumi and others studied demand forecasts using Fourier series [2]. NS. Omekara, E. Ekpenyong, MP Ekerete, and also studied the dynamics of inflation in Nigeria using the Fourier series [3].

N. Liu, V. Babushkin and A. Afshari used this model in their work for short-term prediction of electrical loads. Maurice Omane and others have applied SARIMAX to forecast inflation in Ghana. Sani I. Doguva and Sara O. Alade used these models for short-term forecasting of inflation in Nigeria and others.

Despite the fact that a lot of research has been done in connection with inflation on various aspects in Azerbaijan, the analysis of Fourier series and SARIMAX models has not been implemented in the Azerbaijani economy to study inflation processes.

Unlike other studies, it accounts for the economic shock using a dummy variable.

**Methodology and theoretical foundations of applied mathematical methods.** The Fourier series is also applicable in econometrics, in addition to other areas such as electronics, optics, signal processing, acoustics, etc. [4; 12].

In general, harmonic oscillations change in accordance with the laws of sine and cosine. These changes will be brought to harmonic movements. The number of fluctuations hitting each month is the frequency of the fluctuations. The time it takes for a full swing is a period. Frequency and period are mutually reciprocal values. These are often periodic events, consisting of the summation of a series of harmonic vibrations. As a result, the oscillation graph forms harmonic

oscillations [8]. To determine the inflation dynamics function, we briefly present a simple harmonic series: $\nu = 1 / TT = 1 / \nu$

$$f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx) \quad (2.1)$$

Series (2.1) is a trigonometric series of coefficients, which have the values, ... In equal frequency harmonics, the price x is 0. Series (2.1) is accumulated in

this function for all values  $a_0 a_1 a_2 \dots b_1 b_2 \dots \omega t x = \omega t^X \dots$  That is, the sum of the series is equal to the function  $f(x)$

Harmonic analysis of inflationary processes is an expansion of series in trigonometric series. In order to expand a periodic function with a period of  $2\pi$ , it is necessary to assign the coefficients of this series. It can be calculated using the following formulas:  $f(x) a_0 = \frac{1}{\pi} \int_0^{2\pi} f(x) dx; a_n = \frac{1}{\pi} \int_0^{2\pi} f(x) \cos nx dx;$

$$b_n = \frac{1}{\pi} \int_0^{2\pi} f(x) \sin nx dx; n = 1, 2, 3.. \quad (2.2)$$

Consequently, the series having the above coefficients is called the Fourier series with respect to the function  $\frac{a_0}{2} + \sum_{n=1}^{\infty} (a_n \cos nx + b_n \sin nx) f(x)$ .

In this study, a variable is an argument dependent variable or function. The addition of simpler harmonics more accurately expresses the periodic motion defined by the function. Thus, Fourier series models are more tied to the length of the series. Therefore, the decomposition of the trigonometric series is of great importance [7]. Movements in aggregate demand and aggregate supply and market regulation seeking to ensure macroeconomic equilibrium form cyclical inflationary processes. And the definition of inflation cycles and the construction of models of the Fourier series are based on the Fourier coefficients and the Fourier frequency  $uny_t f(x)$ .

Fourier series analysis is more appropriate for identifying periodic signals of inflation. In this study, inflationary processes are investigated as the summation of simple harmonics. The given harmonics of inflationary processes are repeated every  $t = 2\pi$  time interval [5], in other words, they turn into periodic processes. The summation of the equal-frequency harmonics forms a simple harmonic.

To determine inflationary cycles, one needs to consider more complex harmonics with different frequencies of sine and cosine waves. Therefore, the model of the extended Fourier series with a dummy variable has the following form:

$$(2.3) \widehat{uny}_t = \sum_{n=0}^p c_n t^n + \sum_{n=1}^k (\hat{a}_n \cos n\omega t + \hat{b}_n \sin n\omega t) + \Phi \Pi_t + u_t$$

Here, the inflation rate regression estimates  $\widehat{uny}_t$  -

$\sum_{n=0}^p c_n t^n$  – equation of estimated trends, parameter estimates, - {0,1} - fictitious exogenous variable, residuals or residual of the model  $\hat{a}_n u \hat{b}_n$ , ( $n = 1, 2, \dots, q$ ) –  
 $\Phi \Pi t u t$  –

The coefficients are assessed as follows:  $a_n u b_n$

$$\begin{aligned} a_n &\approx \frac{2}{N} \sum_{t=1}^N \Delta u n u_t \cos \omega_n t \\ b_n &\approx \frac{2}{N} \sum_{t=1}^N \Delta u n u_t \sin \omega_n t \end{aligned} \quad (2.4)$$

The intensity function for the frequency along the row is determined as follows [3]:  $I(f_n) f_n$  ипц

$$(2.5) I(f_n) = \frac{N}{2} [a_n^2 + b_n^2], n = 1, 2, \dots, q$$

Since inflationary processes are cyclical, the  $n$ -th harmonic of the frequency should be assigned to the interval. The Fourier frequency is used to determine the parameters of the Fourier models [3]. The greatest amount of intensity is determined by the cycles of inflationary processes. The trend equations can be specified by the following parameters:  $f_n$  –  $n0 \leq f_n \leq 0.5$

$$(2.6) u n u_t = \sum_{n=0}^p c_n t^n$$

Subtractions of the trend from the original series are calculated as follows: ипц

$$\Delta \widehat{u n u}_t = \sum_{n=1}^k (\hat{a}_n \cos n \omega t + \hat{b}_n \sin n \omega t) \quad (2.7)$$

The structural model of the SARIMAX process is structurally different from the SARIMA model [10; 11; 13; 14; 15].

$$\emptyset(L)\varphi(L^S)(1-L)^d(1-L^S)^D u n u_t = \theta(L)\theta(L^S)\epsilon_t \quad (2.8)$$

Since the SARIMAX model includes exogenous variables. [eleven]. Consequently, the SARIMAX model was built on the consumer price index as a process:  $\{u n u_t\} t \in Z(p, d, q) (P, D, Q)[S]$

$$\emptyset(L)\varphi(L^S)(1-L)^d(1-L^S)^D (u n u_t - \psi X_t) = \theta(L)\theta(L^S)\epsilon_t \quad (2.9)$$

$$u n u_t = \sum_{i=0}^k \alpha_i X_i + \frac{\theta(L)\theta(L^S)}{\emptyset(L)\varphi(L^S)(1-L)^d(1-L^S)^D} \epsilon_t$$

$X_t$  – vectors of an exogenous variable, parameter estimate. the number of exogenous and integrated variables will be additive as follows:  $\psi` - k \{X_{it}, i = 1, 2, \dots, k\}$

$$u n u_t = c + \sum_i^k \gamma_i X_{it} + \mu_t$$

Here, autoregional members.  $\{\mu_t\} t \in Z$

Statistical data.

In this study, statistics cover the period from January 1996 to March 2015. Statistical data are divided into two parts: calibration and control [2].

The information was acquired from the official statistics of the Central Bank of the Republic of Azerbaijan<sup>5</sup>...

Time series stationarity is important in econometrics [5].

Application of extended models of the Fourier series in the study of the cyclical analysis of inflationary processes.

The frequency cannot be seen due to the uncertainty of the schedule. Therefore, the highest intensity is determined based on the periodogram analysis. It was determined that the estimated frequency at the corresponding highest intensity is equal to. This is seen as the frequency of the wave of inflation. (See Table 1, Fig. 1),  $f = 0.0826$

Table 1. Cyclic analysis and diagnostics inflationary processes				
n	Intensity	The inflation cycle	Frequency	Amplitude $n \times$ fluctuations
1	17.55	218	0.0046	0.40
2	6.28	109	0.0092	0.24
...	...	...	...	...
eig hteen	63.26	12.1	0.0826	0.76
...	...	...	...	...
10	0.14	2	0.5000	0.04
9				

Source: Author's calculations and Microsoft Excel 2007.

To determine inflationary cycles, long-term periods were studied, which cover the impact of all economic shocks that occurred during 1996-2015. In the long term, cycle inflation rates have been determined over a 12-month period. Since, the rate of regulation of inflationary processes directed towards equilibrium is equal to 6 (six) months. Hence, markets bring inflation back to equilibrium when prices rise. $t = 2\pi$

<sup>5</sup> CBA official website, <http://www.cbar.az>

As a result of the analysis of the Fourier series, the inflation cycle was determined for 12 months (See Fig. 1, Table 1).

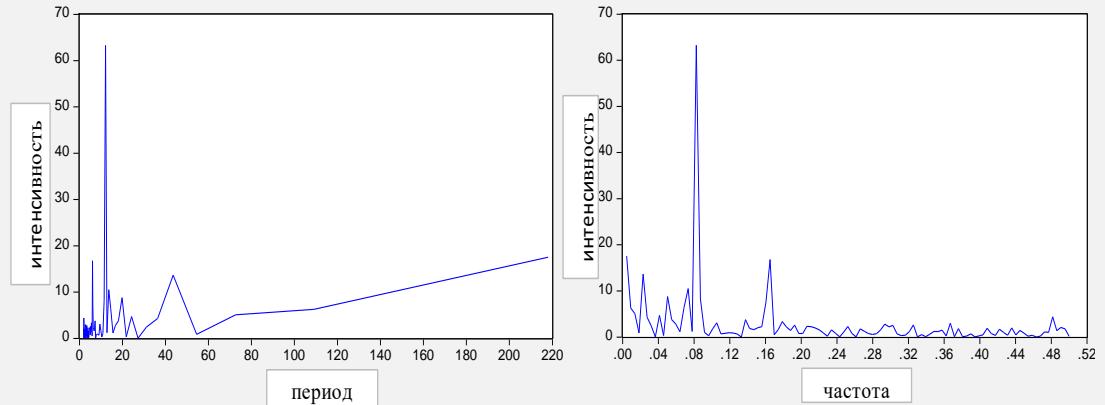


Fig. 1. Intensity and frequency of periods  
Source: Author's calculations and Eviews 7

Below indicated correlogram analysis of ACF and PACF shows periodic effects (see Fig. 2).

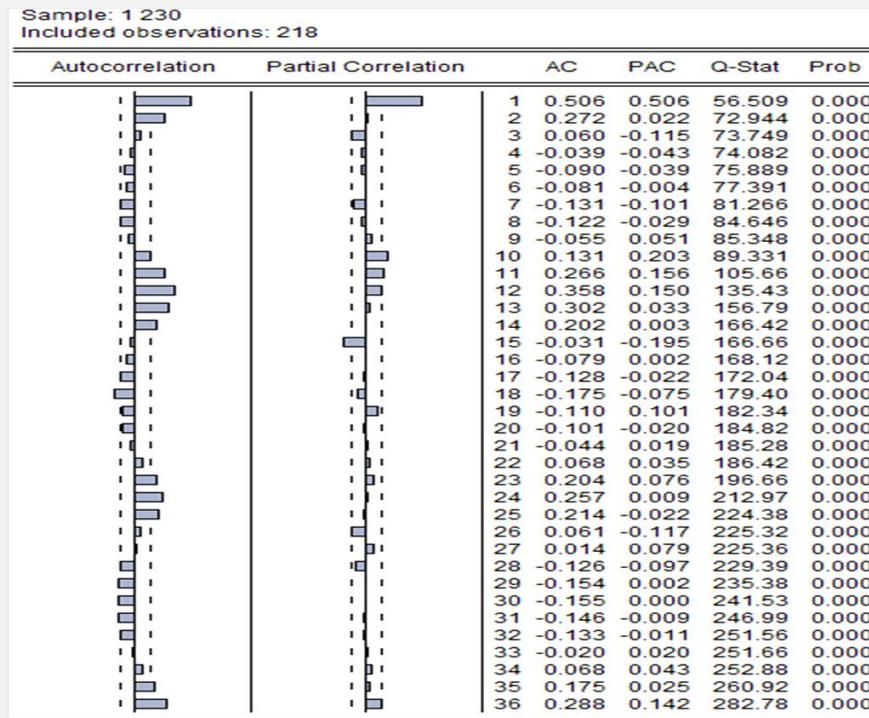


Fig. 2. ACF and PACF, correlogram

Source: Eviews 7

Thus, models with seasonal components can be constructed as follows:

$$\Delta \ln u_t = 0.7256 \cos(\omega t) - 0.3137 \sin(\omega t) - 0.3922 \cos(2\omega t) + \\ 0.2153 \cos(12\omega t) + 0.3372 \cos(13\omega t) + 0.1991 \sin(37\omega t)$$

High frequency and harmonic fluctuations for inflationary processes are respectively equal to 0.0826 and 54.

The econometric estimates of the component show that the autonomous part is statistically significant (see Table 2).

Table 2.

Variable	Coefficients	Std.o tk	t-statistics	probabili ty
Trend component (c)	100.3359	6755 0.00	640.0793	0.0000
Trend component (@trend)	0.001112	125	0.889897	0.3745
Residual component u (-1)	0.333744	0.06	5.185301	0.0000

Source: Author's calculations and Eviews 7

Econometric models with a combination of Fourier series model components take the following form:

$$\begin{aligned} \text{ипц}_t = & 100.4614 + 0.723093\cos(\omega t) - 0.289607\sin(\omega t) \\ & - 0.314703\cos(2\omega t) + 0.241366\cos(12\omega t) \\ & + 0.327632\cos(13\omega t) + 0.212861\sin(37\omega t) \\ & + 0.337403u_{t-1} \end{aligned}$$

To account for economic shocks, the Fourier series models were extended with the FP dummy {0,1} as additive. Then the expansion of the Fourier series will look as follows. Here FP is a dummy variable and is defined as 0 and 1.

$$\begin{aligned} \text{ИПЦ}_t = & 100.4157 + 0.673452\cos(\omega t) - 0.31071\sin(\omega t) - 0.318\cos(2\omega t) \\ & + 0.260353\cos(12\omega t) + 0.317045\cos(13\omega t) \\ & + 0.140359\sin(37\omega t) + 0.244708u_{t-1} + 1.484984 \Phi \Pi \end{aligned}$$

When comparing the quality of models (RMSE, MAE, MAPE, TIC, Durbin-Watson statis. Criterion, Akaike info crit. Fourier series (RF) and extended Fourier series models (RF), it can be seen that RF models are more significant. Fuller show that the model has stationarity at all levels of statistical significance.

Modeling inflationary processes based on SARIMAX models.

As stated above, SARIMAX models are structurally different from SARIMA models. Since SARIMAX models include exogenous variables.

When adding dummy variables, considering economic shocks as exogenous variables, the SARIMAX model looks like this:  $(1 - \phi_1 L)(1 - \varphi_1 L^{12})\mu_t = (1 + \theta_1 L)\varepsilon_t$

$$(1 - 0.4224L)(1 - 0.2420L^{12})\mu_t = (1 + 0.1019L)\varepsilon_t$$

$$\text{ипц}_t = c + \Theta \Phi \Pi_t + \mu_t$$

$$\text{ипц}_t = 100.3304 + 2.085\Phi \Pi_t + \frac{(1 + 0.1019L)\varepsilon_t}{(1 - 0.4224L)(1 - 0.2420L^{12})}$$

$$\begin{aligned} \text{ипц}_t = & 100.3304 + 2.085\Phi D_t \\ & + \frac{\varepsilon_t + 0.1019\varepsilon_{t-1}}{1 - 0.24\text{ипц}_{t-12} - 0.422\text{ипц}_{t-1} + 0.1022\text{ипц}_{t-13}} \end{aligned}$$

The evaluation results of the above constructed SARIMAX models give estimates of the model parameters in the following table.

Table 4. Estimation of parameters of SARIMAX models and quality of forecasting models.

Options	SARIMAX	Standard dev.	SARIMAX (102)	Standard
---------	---------	---------------	---------------	----------

	(100) (100) [12]		(100) [12]	dev.
C	100.3318	[0.143681]	100.3304	[0.14932]
FP	2.060154	[0.481008]	2.085979	[0.489423]
AR (1)	0.454368	[0.063536]	0.422471	[0.064776]
SAR (12)	0.243506	[0.06088]	0.242089	[0.064191]
MA (2)			0.101964	[0.000537]
Determination coefficient	0.426393		0.42843	
RMSE	0.316724		0.15172	
MAE	0.316724		0.15172	
MAPE	0.315524		0.15117	
Akaike info criteria	2.516702		2.52290	
Schwarz criteria	2.581542		2.60395	
Darbin-Watson p.	2.007207		1.94838	

Source: Author's calculations and Eviews 7

When considering the forecasting results of the SARIMAX (100) (100) [12] and SARIMAX (102) (100) [12] models, it can be seen that the SARIMAX (1 0 2) (1 0 0) [12] models have a closer price to the actual indicator (See Table 4). The quality indicators of SARIMAX (1 0 2) (1 0 0) [12] models are considered more acceptable than SARIMAX (1 0 0) (1 0 0) [12]. The SARIMAX model consists of exogenous variables added to the SARIMA model. It is the integration of regression models to SARIMA models. This model combines the advantages of both models. ARIMA methods provide for autocorrelation in residuals. The comparative forecasting schedule for the SARIMAX and RRF models is described below (see Fig. 3, Table 5):

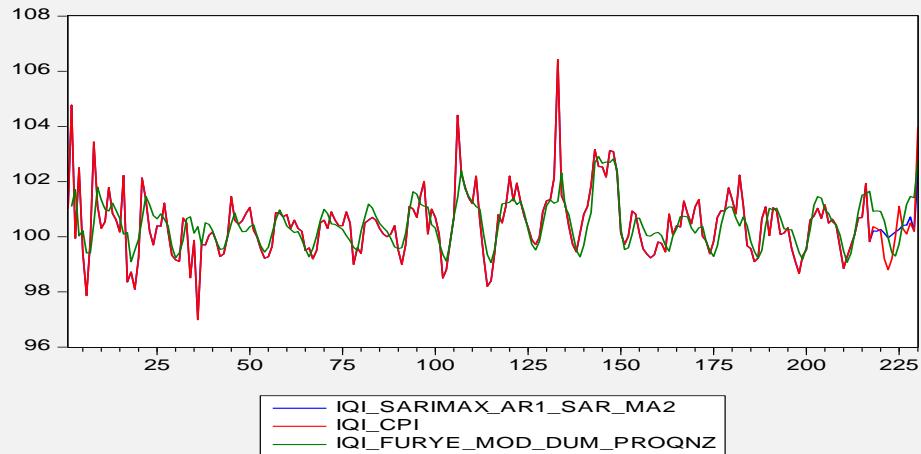


Fig. 3. SARIMAX Model Prediction and Extended Fourier Series

Source: Author's calculations and Eviews 7

Table 5. Estimation of SARIMAX model and Fourier series

n	SARIMAX (1 0 2) (1 0 0) [12] model	Rrf model	CPI
218	100.21	100.92	100.36
219	100.20	100.93	100.30
220	100.27	100.92	100.20
221	100.13	100.57	99.20
222	99.96	99.97	98.80
223	100.07	99.42	99.20
224	100.17	99.30	100.00
225	100.27	99.74	101.10
226	100.41	100.50	100.30
227	100.42	101.17	100.10
228	100.72	101.46	100.50
229	100.21	101.41	100.20
230	102.39	102.77	104.00

Consequently, all these models in forecasting only then acquire an approximation to the actual assessment, when all significant processes occurring in the

economic system are formed on the basis of chance and retain their market mechanisms. These are the necessary conditions for obtaining the smallest deviations in predictive models. Evolutions in the behavior of economic subjects lead inflationary processes from one quality to another. In this case, a sufficient condition is to maintain a significant quality. These conditions increase the adequacy of the approximation of the models to the actual indicators.

Based on the results of the study, it was determined that the use of Fourier series and SARIMAX models is considered more significant in modeling and predicting inflationary processes in Azerbaijan. Consequently, the rate of regulation of inflationary processes aimed at equilibrium is equal to 6 (six) months. For all these models, forecasting only then acquires an approximation to the actual estimate, when all significant processes occurring in the economic system are formed on the basis of chance, and retain their market mechanisms. This is a necessary condition for the smallest deviations in predictive models. Evolutions in the behavior of economic entities transfer inflationary processes from one quality to another. In this case, a significant preservation of quality is a sufficient condition.

Consequently, the application of these methods in the study of inflationary processes is of theoretical and practical importance in determining the macroeconomic monetary policy.

#### Reference

- Maksud Farhad oglu**, “Fundamentals of Philosophy”, Enlightenment, 1998, Baku, 440p.
1. **Andrea F. Arianna P., Laura S.**,“Fourier Analysis for demand Forecasting in a Fasion Company” // International Journal of Engineering Business Management, Vol.5. 2013.P.1-10.
  2. **OmekaraCO**, Ekpenyong EJ, Ekerete MP, Modeling the Nigerian Inflation Rates Using Periodogram and Fourier Series Analysis // CBN Journal of Applied Statistics, Vol. 4. No.2. 2013. P.51-68
  3. **Anumaka M.**, Anaysis of Electric Circuits Using Fourier series // International Journal of Engineering and Innovative Technology, V.1, I. 5, 2012, P.125-128
  4. **Linus OU**,Oladejo M., Another Look at Fourier Coefficients: Forecasting Non-Stationary Time-series using Time dependent Fourier Coefficients // Int'l Journal of Computing, Communication & Instrumentation Engg, Vol. 1. I.1. 2014.P.83-86
  5. **Berman A.F.**, A short course in mathematical analysis, State publishing house of physical and mathematical literature. Moscow. 1963.663 c.

6. **Zaichev I.L.**, Higher Mathematical Courses, Education Baku .. 1965. 434c.
7. **Aliev M.M.**, Physics, Baku. Prosveshenie, 1986.307 p.
8. **Nengbao L.**, Babushkin V., Afshari A., Short-Term Forecasting of Temperature Driven Electricity Load Using Time Series and Neural Network Model // Journal of Clean Energy Technologies, Vol. 2.No. 4.2014
9. **Maurice oa.**, Francis TO, Samuel DO, Determining the Better Approach for Short-Term Forecasting of Ghana's Inflation: Seasonal-ARIMA vs. Holt-Winters // International Journal of Business, Humanities and Technology, Vol. 3.No. 1. 2013. P. 69-79.
10. **Sani I. D.**, Sarah OA, Short-Term Inflation Forecasting Models for Nigeria // CBN Journal of Applied Statistics, Vol. 4.No.2.2013.P.1-29
11. **Leland LL**, Water Temperature Forecasting and Estimation using Fourier Series and communication Theory Techniques // Water Resources Research, Vol.12., No.5.1976. P.881-887.
12. **Otu AO, Osuji GA, OparaJ.**, Mbachu HI, Iheagwara AI, Application of SARIMA models in modeling and forecasting Nigeria`s inflation rates // American journal of Applied Mathematics and Statistics, Vol. 2. No.1.2014.P.16-28
13. **Susan WG, Anthony GW, John MK.**, Forecasting inflation rate in Kenya using SARIMA model // American Journal of theoretical and Applied Statistics, Vol.4 (1). 2015.P.15-18
14. **Suleman N., Albert L., Lea A.**, The efficacy of ARIMAX and SARIMA Models in predicting monthly currency in circulation in Ghana // Mathematical Theory and Modeling, Vol. 3. No.5. 2013. P.73-81

## HOW MUCH RUSSIAN BANKS EXCEEDED IN FINANCIAL INTERMEDIARY?

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*Solanko L., Fungachova Z.*

*Institute for Economies in Transition, Bank of Finland, Helsinki*

E-mail: colenko@rambler.ru

*The purpose of the article is to analyze the process of the increasing role of banks in the Russian economy during the period of growth that took place after the 1998 financial crisis and preceded the current financial cataclysms. We use several indicators to assess the role of banks in financial intermediation in Russia. The traditional approach (from a macro-level perspective) is complemented by an analysis of sectoral financial flows, as well as the results obtained in micro-level studies. All of these approaches confirm that banks play a consistently more important role in financial intermediation. We found that the scale and effectiveness of Russian banks' intermediation have increased over time, but their involvement in financial intermediation still lags behind those in other countries with similar income levels.*

*Key words:* Russia, banks, financial intermediation, financial system.

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Like most other emerging market economies, Russia has a banking-based financial system. However, banking is a relatively new industry for Russia. Most of the banks were established only in the 1990s. Until 1999, the participation of the banking sector in financial intermediation for the needs of the real sector of the economy was at a very modest level. Banks did not direct financial resources to profitable investments and in many cases preferred to speculate in the financial markets or simply act as "treasures" for those who owned them. The ratio of bank lending to total bank assets gradually decreased until 1999. The reasons are soft legal restrictions, asymmetry of information between lenders and borrowers,

After the boom following the 1998 crisis, the Russian banking system began to develop rapidly and began to carry out other standard types of banking activities. In response to the demands of a more stable macroeconomic environment and important institutional reforms, the banking sector began to expand rapidly. The ratio of total banking sector assets to GDP has doubled since 2000, "frozen" at 65% at the end of 2008. The Banking Reform Index used by the EBRD increased from 2 (in 1998) to 2.7 (in 2006) ... If we consider that the values of this index range from 1 to 4, then a value of 3 indicates a significant im-

provement in the legislation on bank solvency, great progress in creating conditions for responsible control and regulation, as well as an impressive number of private banks.<sup>1</sup>... Both the expansion of the scale of institutional reforms and their progress in Russia indicate the growing role of banks in the economy.

Despite these advances, it is unclear to what extent Russian banks can meet the needs of the economy. The data presented in the table with a number of commonly used indicators indicate that the development of the banking sector in Russia still lags behind many other countries with economies in transition. This circumstance can have serious consequences for further economic growth in the country. A significant number of scientific studies (for example, (Levine, Zervos, 1998; Beck, Levine, 2004)) data are based on IMF's International Financial Statistics Database, EBRD (Germany is not included in the EBRD index, level 4 corresponds to the standards of developed industrial economies). Confirms the point of view that the development of the banking sector has a positive effect on economic growth.

In this article, we explore how the role of the banking sector in financial intermediation in Russia has evolved during the period of economic growth that followed the 1998 crisis and preceded the current crisis. We are not going to analyze the current global crisis and its impact on the Russian financial markets. Our goal is to investigate the processes before the crisis. We believe that it is important to study the dynamics that preceded the crisis in order to better understand the prospects for growth over a long period of time. There is a collection of excellent articles on the analysis of the current crisis in the Russian banking sector and published in the Journal of the New Economic Association<sup>2</sup>...

Our approach to this topic is to combine and contrast the results obtained in studies of financial intermediation, carried out from several different points of view. Since there is no single universally accepted definition of financial intermediation, we tend to believe that it is useful to take into account different positions from both a macro-level and a micro-level perspective. This article is naturally limited by the fact that we rely on publicly available data and mainly on publications in Western economic publications. However, we are aware that there are many Russian-language works devoted to this topic. We will do our best to provide relevant links. First, we examine most of the widespread aggregate indicators of financial intermediation, namely: the ratio of aggregate indicators of the banking sector to indicators of the entire economy. We then analyze sectoral financial flows, finding out which sectors in the Russian economy are creditors and which are debtors. After that, we will supplement our research

with micro-level data analysis, which will allow us to explore some aspects of the effectiveness of financial intermediation in the Russian banking industry.

#### **Measuring financial intermediation at the aggregate level**

Usually, the level of financial intermediation in a country is measured by ratios reflecting the ratio of bank assets and bank credit to GDP. In Russia, the ratio of bank assets to GDP doubled from 2000 to 2008, exceeding 65% at the end of 2008 (Fig. 1). Similar changes took place with the indicator of bank loans to the private sector, which actually exceeds 40% of GDP.

These aggregates support the view that financial intermediation has grown rapidly in Russia in recent years.

Despite impressive growth, Russia is still lagging behind not only developed economies in terms of financial intermediation, but also behind its counterparts in Central and Eastern Europe (Chart 2).

The role of bank loans as a source of financing investments in fixed assets of companies increased from less than 5% at the beginning of 2000 to 11% at the beginning of 2008 (Rosstat, 2008). The role of other financial intermediaries in Russia is even less significant than that of the banking sector. The only major source of funding for Russian companies is their own funds. In 2008, these resources financed about 40% of such investments, which is less than in 2002, when this figure was 48% (Rosstat, 2008). Another important source is budgetary resources, which are used to finance approximately one fifth of fixed capital investments. Despite a significant increase in the volume of issue of shares by Russian companies, especially in 2006 and 2007,

The bond market is also not developed: only a few large Russian companies have issued bonds. The share of corporate bonds in financing investments in fixed assets is less than 1%. The ratio of bonds of non-financial corporations to GDP in 2008 was 2.4%, which is significantly less than the same indicator in developed countries (Ulyukaev, Danilova, 2009). The situation is similar in the Eurobond market: in 2008, the total volume was 3.1% of GDP. The performance of the indices used by the EBRD confirms that this figure is in line with those of other transition economies.

Insurance companies also do not make a significant contribution to financial intermediation in Russia. The sector is very small and underdeveloped, with premiums reaching only 2.3% of GDP, which corresponds to about one fifth of that in developed countries (Swiss Re, 2009). Most of the insurance business is involved in non-life insurance business that could generate financial resources for long-term investments. The long-term nature of insurance only adds to the

growing distrust of Russian financial institutions. Analysis of sectoral financial flows

We will consider in more detail the role of banks in financial intermediation, applying the analysis of financial flows between the commercial banking sector and other sectors of the economy. It is assumed that banks - as financial intermediaries - move resources from investors to the productive sectors of the economy. This analysis reveals their true role. Moreover, this approach allows us to investigate whether there are any structural breaks in the period under consideration.

Following (Kocenda et al., 2007), we treat the economy as a set of sectors exchanging financial assets. The following sectors are considered as the main economic players: state, non-financial companies, individuals, the Central Bank, as well as other banks. The flow of resources between the banking sector and other sectors is traced through the intermediation ratios, which reflect the shares of the total assets of the banking sector that originate in the other five sectors. This creates a more complete picture of the role of banks as debtors in the economy. Likewise, we analyze the other side of the banking sector balance sheet, noting which sectors receive bank loans. Thus, we can assess the contribution of each sector to the development of the banking system, and the volume of resources transferred by the banking sector to other sectors. The data used in our study was obtained from the Bank of Russia. This is a quarterly time series from the first half of 2000 to the end of 2008. Due to differences in data specifications, direct comparisons between countries should be made with some caution, and such comparisons are beyond the scope of this article. However, we are able to make at least some (very rough) comparisons with the results obtained in (Kocenda et al., 2007) based on data from CEE countries. Due to differences in data specifications, direct comparisons between countries should be made with some caution, and such comparisons are beyond the scope of this article. However, we are able to make at least some (very rough) comparisons with the results obtained in (Kocenda et al., 2007) based on data from CEE countries. Due to differences in data specifications, direct comparisons between countries should be made with some caution, and such comparisons are beyond the scope of this article. However, we are able to make at least some (very rough) comparisons with the results obtained in (Kocenda et al., 2007) based on data from CEE countries.

The share of retail deposits in the total assets of the banking sector gradually increased - from less than 20% in 2000 to almost 30% in 2004. Our research revealed that individuals were the largest lenders of banks between February

2002 and February 2006. (Fig. 3). The very low share of retail deposits in the first years after the August 1998 crisis was caused by a lack of trust among depositors in the banking industry, as well as by a drop in real incomes. In 2006, the share of retail deposits in the total assets of the banking sector began to decline after the growth in corporate deposits apparently outstripped the growth in retail deposits. This trend continued during the current financial crisis. Thus, at present the largest creditors of Russian banks are non-financial companies. Their share in the total assets of the banking sector exceeded 30% by the end of 2008. In contrast to Russia, individuals are the largest lenders of banks in Central European countries with economies in transition. Individual deposits are viewed as the most important source of resources for banks, as these deposits tend to have maturities longer than those of non-financial companies.

Another important source of inflows to the banking sector is loans from other financial institutions, which during the entire period under review accounted for approximately 10% of the banking sector's assets. Based on micro-level data, Karasetal (2008) shows that although large banks reduced their dependence on interbank financing from 25% in 1999 to 10% in 2004, they are still more dependent on interbank financial markets. instruments than smaller jars. Moreover, they show that large banks continue to rely mainly on transactions with foreign partner banks (Figure 4). This led to the fact that in 1999-2004. the volume of transactions with foreign assets all the time exceeded the volume of domestic interbank transactions. We have good reason to believe

The role of the government as a lender to the banking sector was not significant and in fact diminished. It currently accounts for less than 0.5% of the banking sector's assets. Finally, the role of the Central Bank in providing financial resources to the banking sector has become more significant only recently, including as a result of the current financial crisis and attempts by the authorities to stabilize the situation. In general, during the analyzed period, financial flows from the Central Bank to the banking sector were close to zero. However, it is important to remember that the state plays a very significant role in the banking sector, since it currently owns approximately half of the sector's total assets.3... On the other hand, foreign participation in banking is still rather modest. The number of foreign-owned banks at the end of 2008 increased to 2214 (from 130 in 2000), while the total number of registered banks was 1108. Examination of the other side of the coin shows that the most significant flows from the banking sector to other sectors are those directed to non-financial companies. This conclusion is well supported by data for Central European countries, where non-financial companies are also the largest borrowers. New positive trends in the

field of financial intermediation are that the share of funds that banks lend to these companies increased until 2008, and some subsequent slowdown occurred only due to the global financial crisis at the end of 2008. Another positive trend in this area is associated with the fact that the volume of loans to individuals also increased to 15% in 2008. (from about 2% of total banking assets in 2000). Traditionally, individuals have not been important banking clients in Russia. However, in recent years, their importance has increased significantly. However, the indebtedness of individuals remains small in comparison with developed countries, as well as with other countries with economies in transition. This circumstance can be seen as an advantage during the ongoing financial cataclysms. Flows from the banking sector to the Central Bank have remained relatively stable over the period under review, although the data are obviously seasonally significant. as well as with other countries with economies in transition. This circumstance can be seen as an advantage during the ongoing financial cataclysms. Flows from the banking sector to the Central Bank have remained relatively stable over the period under review, although the data are obviously seasonally significant. as well as with other countries with economies in transition. This circumstance can be seen as an advantage during the ongoing financial cataclysms. Flows from the banking sector to the Central Bank have remained relatively stable over the period under review, although the data are obviously seasonally significant.

There are no significant gaps in financial flows to and from the banking sector between 2000 and 2008. During this period, the system gradually expanded, and, obviously, there were no major changes that would significantly affect this trend. Unlike the Central European countries, the Russian banking sector has not undergone large-scale privatization. In general, our analysis of financial flows between sectors indicates that banks increasingly moved funds to the real sector of the economy and gradually began to play their role as financial intermediaries.

#### **How effective has mediation been?**

The growing involvement of banks in the allocation of financial resources raises the question of how costly and efficient their intermediary services are. To answer this question, it is necessary to move our attention from the aggregate level to the micro level, i.e. refer to the review of data on specific banks. The role of banks in the economy is not only to transform savings into investment, but also to ensure the quality of borrowers and increase the likelihood that their innovations will be successful. Therefore, a banking performance analysis that measures the relative ability of banks to efficiently use their resources to gener-

ate “output” can lead to valuable findings. Since there is a strong tradition of research,

In the literature on how costly and efficient bank intermediation is, the generally accepted approach is to examine the bank's interest margin and its determinants.<sup>5...</sup> In general, the analysis of the size of the interest margin and the rationale for these sizes presupposes the existence of a tradeoff. On the one hand, high margins create obstacles to deepening financial intermediation in the country, as lower interest rates on deposits reduce incentives to create savings in the form of bank deposits, and high interest rates on loans narrow the investment opportunities of banks. Moreover, large margins can create problems in the banking regulatory environment and information asymmetries (Claeys, VanderVennet, 2008). On the other hand, larger margins can increase the profitability of the banking sector and bank capitalization, as well as strengthen the financial position of the sector, creating additional reserves in the event of negative shocks. But overall, the empirical evidence indicates that margins are smaller in more advanced banking systems. In Russia, the net interest margin, as shown below, is still quite high compared to the same indicator in other countries (Fig. 5)<sup>6...</sup>

In work (Fungáčová, Poghosyan, 2009), quarterly data for all Russian banks for the period from 1999 to 2007 are used to calculate the values of net interest margin, defined as the difference between interest income and interest expense divided by total assets. In general, during the period under review, margin values decreased. This indicates the fact that the process of financial intermediation has become less costly for society.

Further in the specified work, the importance of factors influencing the value of the margin and identified in the theoretical model of Ho and Saunders (Ho, Saunders, 1981) is analyzed. These factors include: market concentration, operating costs, risk aversion, credit risk, liquidity ratio and bank size. Using economic terminology, one can formulate...

**Note...** Net interest margin - the book value of the bank's net interest income, expressed as a share of (total) interest-earning assets.

We define pearl interest margin as the proportion of net interest income that can be generated by interest bearing assets and compare Russian figures with similar figures for other countries.

to formulate the following conclusion: the most significant influence on the size of the interest margin of banks in Russia is exerted by operating expenses. Operating costs incurred by banks are passed on to customers through higher margins charged for financial services. In this regard, Russian banks still “have

room to develop" in terms of improving their operational efficiency, because the ratio of non-interest expenses to total assets is, on average, much higher than in developed or Central European countries (Moody's, 2008).

Risk aversion on the part of the bank is positively related to the size of the margin. Banks with greater risk aversion charge higher margins. All other significant factors are negatively related to the size of the margin. First, the negative relationship between the size of banking operations and the value of margin confirms the existence of economies of scale, as larger banks tend to charge lower margins. A more significant liquidity ratio allows the bank to reduce its margin. Finally, the negative relationship between credit risk and margin value can be explained by the application of market discipline in Russia (Karas, Pyle, Schoors, 2009). Depositors demand higher premiums for putting their savings in banks with a higher level of credit risk.

In Russia, however, interest margins are not affected by changes in the market structure as measured by the regional Herfindahl index. This contradicts the results obtained in earlier studies of trends in developed countries, as well as the prediction of the theoretical model, according to which the coefficient will be positive. This conclusion is consistent with the results obtained from the analysis of economies with newly emerging market economies. These results are mixed and not always significant. The insignificant value of the market structure ratio may indicate the fact that regional concentration in the Russian banking sector has not changed significantly over time. It is clear that there are several dominant players in this market, and the changes in the rest of the banking system are not large enough.

#### **Financial intermediation abroad**

Our research indicates that in recent years Russian banks have become increasingly involved in financial intermediation. Moreover, a slight decrease in the level of the bank interest margin reflects a positive trend in the efficiency of financial intermediation, although here, we repeat, there is still "room for development." All these changes were caused by the rapid economic growth and the growing integration of the Russian banking sector into global financial markets.

Despite impressive growth rates in the 2000s, the Russian banking sector remains extremely small relative to the size of the entire economy. Individuals, as well as small businesses in Russia, usually have little or no contact with the financial system. Just over 10% of fixed capital investments are financed through bank loans, and despite the marked demonetization after the 1998 crisis, only about one third of the population has bank accounts. Due to the banking crisis of the 1990s, the population still distrusts the banking system<sup>7</sup>... At the

same time, large Russian oil, gas and metallurgical companies have financial needs that significantly exceed the capabilities of domestic financial markets. Large Russian companies involved in the development of natural resources are “big” even by world standards. In fact, they are an integrated part of the world economy. The financial needs of companies such as Gazprom, Rosneft and Lukoil are mainly met by the global financial markets. These companies have significant export earnings and their revenue streams are largely dependent on changes in the global economy. In fact, large global financial groups also have more knowledge and skills to analyze the actions of these companies than local Russian banks.

This is confirmed by the growing number of syndicated loans issued by foreign lenders to Russian borrowers in recent years. The syndicated loan business began to expand in Russia as early as 1997, as such loans were the only sources of financing for companies that did not have credit ratings. The 1998 financial crisis prevented the issuance of such loans, but the growing demand for long-term financial instruments, associated with rapid economic growth in the 2000s, again contributed to a significant increase in the scale of syndicated lending. In both 2005 and 2006, the volume of syndicated loans issued in Russia exceeded \$ 50 billion, which is about one-fifth of the domestic loans provided to the non-financial private sector, according to BIS reports. Further, in 2007,

Despite this boom, Russian lenders did not play a significant role in the syndicated loan business (Russian banks were visible only as recipients of such loans). The expansion of the volume of issued syndicated loans was mainly associated with the activities of non-Russian banks. Russian banks provided only about 2% of the funds issued in the form of syndicated loans for the period from 1997 to 2006.<sup>8</sup> Moreover, the banking literature argues that the presence of a local bank in a loan syndicate creates significant informational advantages in monitoring. These benefits usually translate into a smaller credit spread for the borrower. However, in the work (Fungáčová et al., 2011) shows that things are different in Russia. The presence of the Russian bank in the loan syndicate did not reduce these spreads. This circumstance obviously indicates that Russian banks have no informational advantages over international lenders when granting loans to large Russian firms. This may be a consequence of the relatively small size of Russian banks, their short experience in dealing with participation in international syndicates, or a general phenomenon of mistrust in Russian banks. In most other developing countries, such shortcomings of domestic banks are more than offset by the positive value of better knowledge of local conditions.

All this means that Russia not only has a dualistic economy, characterized by the presence of strategic sectors controlled by the state, and a non-strategic sector open to all. Apparently, the country also has a dual financial system: a domestic sector serving local clients and an international sector characterized by minimal participation of Russian banks. Until the onset of the global financial crisis, large corporations could rely on international markets to finance their investments, and usually only needed an internal banking system to process their payments. It is possible that this aspect is an additional explanation for the relatively small size of the domestic banking system (Sutela, 2009).

Since the structure of the Russian economy is likely to continue to evolve in the future towards the dominance of very large corporations engaged in the development of natural resources, there are no simple or quick ways to expand the domestic banking system at the expense of a foreign one. But, of course, strengthening the insurance industry and domestic pension funds would be beneficial as a factor in creating a more stable base for domestic funding.

The existence of a dual system is not necessarily “good news” for local, non-export-oriented clients with no access to international financial markets. If a company generating, for example, 8% of GDP nine, needs an internal system only to carry out their payments, the growth prospects of the internal banking system are far from bright. Over a longer period of time, this may mean more limited access to finance for the rest of the economy, which nevertheless creates a dominant mass of jobs in Russia. The current financial cataclysms are severely curtailing foreign funding, prompting even large, export-oriented corporate clients to turn to domestic banks. It remains to be seen to what extent these companies can return to international financial markets in the long run.

#### **Concluding remarks and future perspectives**

The expansion of the banking sector during the economic boom from 2001 to 2008 was impressive. During this period, the size of the banking sector in relation to the economy doubled. Moreover, lending to the real sector (ie, businesses and households) increased rapidly, and a growing, albeit still small, share of investment in fixed assets was financed through bank loans. It is clear that the banking sector has begun to play a more important role in transforming savings into investment and consumption. In addition, there appears to have been some improvement in the effectiveness of mediation as well, but this increase was relative to a very low baseline. A McKinsey report argues that the efficiency level of Russian “retail” banks is only 23% of the US level (McKinsey, 2009).

Predicting the future is always a thankless task. Perhaps the current global financial crisis will at best prove to be some kind of milestone on the road to a

more efficient banking system. Wherever a crisis occurs, it has wiped out the least performing firms, and it is possible that many of the very small and unreliable Russian banks will be closed as a result of the current economic collapse. If management were prudent, the restructuring of the banking industry could ultimately give larger and better managed, as well as more efficient, banks a dominant position in the sector. Many of them could well participate in banking activities at the international level, especially since borrowing from abroad, even from the largest Russian corporations, stopped during the crisis.

However, there is always the possibility that the future will turn out to be different from what we hope for. If international financial markets remain closed for a long time, large corporations involved in the development of natural resources will have to rely only on domestic markets. In all likelihood, they will crowd out a host of other borrowers and put clients inside the country in an even worse position. Moreover, the domestic banking sector may emerge from the crisis weakened, and its credibility will actually be undermined for several more years.

**References:**

- Belousova V.Yu.** (2009): Cost efficiency of homogeneous Russian commercial banks: an overview of the problem and new results // HSE Economic Journal. T. 13 (4). S. 489-519.
- Golovan S.V., Karminsky A.M., Peresetsky A.A.** (2008): The effectiveness of Russian banks in terms of minimizing costs taking into account risk factors // Economics and Mathematics. methods. T. 4.P. 28–38.
- Ulyukaev A., Danilova E.** (2009): Banks' External Debt as a Source of Financing the Investment Strategy of Russia: Risks and Regulation Mechanisms // Money and Credit. No. 5.
- Central Bank (2002-2009): Central Bank of the Russian Federation. Review of the banking sector of the Russian Federation (various issues).
- Beck T., Levine R.** (2004): Stock Market, Banks and Growth: Panel Evidence // Journal of Banking and Finance. Vol. 28 (3). P. 423-442.
- Caner S., Kontorovich V.** (2004): Efficiency of the Banking Sector in the Russian Federation with International Comparison. Economic Journal of the Higher School of Economics. T. 8 (3). S. 357–375.
- Claeys S., Vander Vennet R.** (2008): Determinants of Bank Interest Margins in Central and Eastern Europe: A Comparison with the West // Econ. Systems. Vol.32. P. 197-216.

**Fungáčová Z., Godlewski C., Weill L.** (2011): Asymmetric Information and Loan Spreads in Russia: Evidence from Syndicated Loans // Eastern European Economics Vol. 49. No. 1. P. 13-30.

**Fungáčová Z., Poghosyan T.** (2011): Determinants of Bank Interest Margins in Russia: Does Bank Ownership Matter? // Economic Systems (forthcoming).

**Ho T., Saunders A.** (1981): The Determinants of Bank Interest Margins: Theory and Empirical Evidence // Journal of Financial and Quantitative Analysis. Vol. 16 (4). P. 581-600.

**Karas A., Schoors K., Lanine G.** (2008): Liquidity Matters: Evidence from the Russian Interbank Market. University of Ghent, Economics Faculty Working Paper 2008/520.

**Karas A., Pyle W., Schoors K.** (2010a): How Do Russian Depositors Discipline Their Banks? Evidence of a Backward Bending Deposit Supply Function. Oxford Economic Papers 62 (1). P 36–61.

**Karas A., Schoors K., Weill L.** (2010b): Are Private Banks More Efficient than Public Banks? Evidence from Russia // Econ. of Transition. Vol. 18 (1). P. 209-244.

**Kočenda E., Hanousek J., Ondko P.** (2007): The Banking Sector in New EU Member Countries: A Sectoral Financial Flows Analysis // Czech Journal of Economics and Finance (Finance a uver). Vol. 57. P. 200-224.

How successful are Russian banks in financial intermediation?  
116

**Levine R., Zervos S.** (1998): Stock Markets, Banks, and Economic Growth // American Econ. Rev. Vol. 88. P. 537–558.

Lean Russia (2009): Lean Russia. Sustaining Economic Growth Through Improved Productivity. McKinsey Global Institute.

Moody's Global Banking (2008): Moody's Global Banking: Banking System Outlook for Russia. September.

**Peresetsky A.** (2010): Bank Cost Efficiency in Kazakhstan and Russia. BOFIT Discussion Paper 1/2010. P. 1–29.

**Sutela P.** (2009): Russian Finance: Drag or Booster for Future Growth? In: Balling, M. (ed.) "Current Trends in the Russian Financial System". SUERF Studies 2009/2.

Swiss Re (2009): World Insurance in 2008: Life Premiums fall in Industrialized Countries - Strong Growth in the Emerging Economies [Electronic publication]. Swiss Re // Sigma. No. 3/2009. Access mode:

<http://www.swissre.com/sigma/>, free. Title from the screen. Language. English (date accessed: December 2010).

European Bank (2007): European Bank for Reconstruction and Development: Transition Report 2007.

**Vernikov A.** (2009): Russian Banking: The State Makes a Comeback. BOFIT Discussion Papers 24/2009. Bank of Finland.

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## INCREASING PENSION AGE: PRO ET CONTRA

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*Maleva T.M., Sinyavskaya O.V.*

*NISP, Moscow*

E-mail: malevst@yandex.ru

*The aging of the population and the growing deficit of the Russian pension system put the question of raising the retirement age on the agenda. The article examines the world experience in regulating the retirement age. The arguments "for" and "against" raising the retirement age in Russia, which lie in the plane of demography, the labor market, the pension system, and the attitude of the population to this initiative, are critically discussed. The necessity of increasing the actual retirement age is substantiated and the author's position on how it would be better to do it is stated.*

*Key words:* *retirement age, life expectancy, early pensions, employment of the elderly, aging, pension reform.*

*Keywords:* *pension age, life expectancy, early retirement, elderly employment, aging, pension reform.*

The question of raising the retirement age is painful for the population of any country, since it implies a change in the previously adopted social contract between the state and its citizens regarding the time when the "well-deserved rest" begins. Indeed, the creation of pension systems, and with them, the establishment of the retirement age for old age, meant the emergence of a legal border of old age, marking the moment when an individual turns from a payer of pension contributions (taxes) to a recipient of pension payments. As a result, in modern economies at the macrolevel, the retirement age is one of the main regulators of the ratio between the number of pensioners and payers of the pension system, affecting its balance and financial stability. Receiving an old-age pension formally means stopping work,

The interest in the problem of raising the retirement age that has arisen in the world over the past two decades is associated with these two functions in the pension system. In the labor market, it is caused by the beginning of the aging of the population, as a result of which the total labor supply of young people is decreasing, and the elderly are living in retirement much longer than a century ago, when states first assumed the responsibility of social protection of people who have lost the ability to earn a living.

In Russia, this issue has a special destiny. Initially, in the mid-1930s, the boundaries of the retirement age in the USSR were set at a relatively low level: 60 years for men and 55 years for women. They were never revised later. The problem of raising the retirement age, although it arose from time to time, did not go beyond the special scientific literature and behind-the-scenes discussions, since the relatively low retirement age in the USSR and Eastern European countries was considered as one of the main legal gains of workers under socialism. and therefore she did not have formal grounds for discussing1...

In the second half of the 1990s, in the course of developing the concepts of the pension reform, the issue of raising the retirement age was also repeatedly raised (Pension reform, 1998) and was also repeatedly pushed back into the uncertain future.

In the course of the 2002 pension reform, it was supposed, firstly, to reform early old-age pensions assigned before the generally established retirement age, and, secondly, to stimulate voluntary later application for a pension. The very same boundaries of the standard retirement age - 60 years for men and 55 years for women - remained unchanged.

The implementation of the reform showed that none of the above two tasks was achieved (Maleva, Sinyavskaya, 2005). At the same time, eight years after the start of the reform, the pension system is again in a situation where its own income is insufficient to pay pensions. Its dependence on budget payments is growing (Gurvich, 2010). Among the various instruments for solving the problem of long-term balancing of the pension system, they again turn to the issue of raising the retirement age.

This time the discussion crossed the boundaries of expert discussion and acquired a broad socio-political character, which manifests itself in an acute polemical form. Today, politicians and representatives of the executive branch, who are directly related to decision-making, are already speaking out on this issue. At the same time, as one would expect, opposing points of view are expressed.

*A. Isaev, Chairman of the State Duma Committee on Labor and Social Policy:* “Raising the retirement age seems socially unacceptable to most citizens ...” (<http://www.molgovardia.ru/groupchanges/2010/07/06/18974>).

*V. Putin*, the Prime Minister of the Russian Federation, assures that “the issue of raising the retirement age is not being considered”: “we are not even going to raise it in the government” (<http://www.rg.ru/2010/08/31/pensii-anons.html> ).

*A. Kudrin*, First Deputy Prime Minister of the RF Government, Minister of Finance: "This (deficit) will inevitably lead to the fact that the retirement age will be increased. It's even difficult to discuss it" (<http://top.rbc.ru/economics/18/06/2010/423537.shtml>).

*A. Drozdov*, Chairman of the Board of the Russian Pension Fund: "Now the state is actively involved in solving health problems and increasing the life expectancy of the population, and after the situation reaches a qualitatively new level, the authorities will be able to return to the issue of raising the retirement age. But this will become possible not earlier than in a few years" (<http://www.rg.ru/2010/09/16/pensiya.html>).

*T. Golikova*, Minister of Health and Social Development of the Russian Federation: "I do not share the position of Alexei Leonidovich (Kudrin, head of the Ministry of Finance) that this can be done in two years." At the same time, she stressed that "one cannot but prepare the population even for the topic of discussion" ([http://www.1tv.ru/projects\\_edition/si=5756&fi=5457](http://www.1tv.ru/projects_edition/si=5756&fi=5457)).

This controversy, as well as the acute issues facing the pension sector, once again force us to return to the arguments and counterarguments regarding raising the retirement age in Russia. World retirement age: facts and figures

Let us turn to the history of the formation of pension systems in different countries of the world. First of all, it should be recognized that demographic factors did not have a direct impact on decisions on the retirement age limit. Different countries established different pension schemes, official and actual retirement ages, which reflected their historical, cultural and economic characteristics. At present, in developed countries it is impossible to establish a direct relationship between the retirement age and life expectancy (Table 1). There is no connection between the retirement age and the proportion of the elderly population (Zakharov, Rakhmanova, 1997).

When designing the first pension systems, the financial capabilities of the state were always put in the foreground. At the end of the XIX - beginning of the XX century, old-age pensions began with the establishment of high age limits: 70 years in Germany and Great Britain, 65 years in the USA and France. These age limits in no way corresponded to the demographic realities of those days - no more than half of 20-year-old men had a chance to live to 65, and even less to 70.

In recent decades, many approaches have been developed to reforming pension systems. Even in countries where the retirement age was initially set at a relatively high level, the intensive aging process has forced the question of changing the age limits for retirement. After all, if pensioners do not work and,

accordingly, are dependents, then, regardless of how pensions are financed, an aging population with unchanged retirement age limits means an increase in the share of consumers of national income (Barr, 2000). Accordingly, raising the retirement age can reduce the number of such consumers and reduce the cost of paying pensions. At the same time, the working-age population is growing, which can lead to an increase in employment, which, in turn, leads to an increase in production and total revenues of the pension system due to insurance premiums. This allows us to consider raising the retirement age as the most effective mechanism for adapting the pay-as-you-go pension system to the aging of the population, since it is not associated with either a reduction in pensions or an increase in contributions (Barr, 2000). So, for example, according to the forecast estimates of E.T. Gurvich, raising the retirement age in Russia from its current borders to 62.5 years for men and women would increase the number of employees by 9.9%, reduce the number of pensioners by 35.9% and only due to this increase the replacement rate by 71% ( Gurvich, 2008). This allows us to consider raising the retirement age as the most effective mechanism for adapting the pay-as-you-go pension system to the aging of the population, since it is not associated with either a reduction in pensions or an increase in contributions (Barr, 2000). So, for example, according to the forecast estimates of E.T. Gurvich, raising the retirement age in Russia from its current borders to 62.5 years for men and women would increase the number of employees by 9.9%, reduce the number of pensioners by 35.9% and only due to this increase the replacement rate by 71% ( Gurvich, 2008). This allows us to consider raising the retirement age as the most effective mechanism for adapting the pay-as-you-go pension system to the aging of the population, since it is not associated with either a reduction in pensions or an increase in contributions (Barr, 2000). So, for example, according to the forecast estimates of E.T. Gurvich, raising the retirement age in Russia from its current borders to 62.5 years for men and women would increase the number of employees by 9.9%, reduce the number of pensioners by 35.9% and only due to this increase the replacement rate by 71% ( Gurvich, 2008).

At the same time, the possibilities for raising the retirement age are not the same for different countries. Any change in the acquisition of pension rights, which includes raising the age of its appointment, affects the interests of a significant part of the population, and, accordingly, is a politically difficult measure to implement. Therefore, despite the fact that the establishment of the boundaries of the retirement age has never been rigidly related to the parameters of life

expectancy, its postponement can serve as a weighty argument in favor of raising the retirement age.

The retirement age in most Western European countries has never been as low as in the socialist countries. However, these countries in the 1980s and 1990s also faced the need to raise the retirement age. Among them, Italy, Finland and France should be noted, in which this age was increased from 60/55 years for men and women, respectively, by 5–10 years (see Table 1).

In France, where this issue is again on the agenda, it is currently about raising the minimum age for granting an old-age pension from 60 to 62 years for both sexes, but at the same time, the age for granting a full old-age pension is already 65 years. At present, Germany, Great Britain, and the USA are also in the process of increasing this parameter of the pension system. In addition, most of the developed countries have established the same age thresholds for the appointment of a pension for women and men. The former socialist countries are currently moving along this path. The retirement age has been raised in all the countries of Central and Eastern Europe (CEE) that are part of the European Union (EU), as well as in most of the former Soviet republics.

In addition, many developed and former socialist countries are changing the conditions for early retirement. As a rule, it is about toughening the requirements for the length of service required for the appointment of such pensions, raising the minimum age for assigning early pensions, as well as abolishing early pensions due to special working conditions and encouraging policies to improve working conditions (Zaidi, Whitehouse, 2009 ). These steps are aimed at raising the effective retirement age.

Finally, it is believed that pension reforms by changing the entire concept of retirement benefits, switching to full insurance principles and calculating a pension based on all contributions paid and the expected duration of pension receipt, will contribute to voluntarily postponing the moment of retirement. Several assumptions underlie this assumption. First, it is believed that the increase in the size of the pension for each additional year worked in the new pension systems will be higher than in the old ones. Second, it is assumed that the employee is able to estimate the amount of pension increment for each year that he postpones retirement. Obviously, at least the latter assumption implies a high level of awareness and education of the employee, as well as his confidence in the future. It is unlikely that this condition is met in most countries in Latin America and Central and Eastern Europe, which are carrying out radical changes in their pension systems. There is still no real evidence of the success of such “soft” schemes for raising the retirement age, which forces countries, along with large-

scale pension reforms, to pursue the traditional policy of "hard" raising the retirement age.

At the same time, the scale and speed of a "hard" increase in the generally established age for granting a pension depends on political and economic factors. Among the latter, an important role is played by the ratio of the benefits of the pension system from raising the retirement age and the ability of the labor market to absorb an increase in the supply of labor for older workers, as well as a possible increase in social spending on programs for people with disabilities, etc. In order to minimize possible negative consequences, many countries are introducing a new scheme of extremely slow - over several decades - raising the limits of the age of granting a pension. For example, an increase in the age from 65 to 67 years is planned in Australia over 2017–2023, in Germany - between 2012 and 2029, in Denmark - between 2024 and 2027. In 2012, Hungary will start raising the retirement age from 62 to 65 years old. Czech, gradually increasing the retirement age to 63 years, planned its further increase to 65 years by 2030. 1 shows data on retirement age against the background of life expectancy in various countries and regions of the world.

Raising the retirement age in Russia: old and new arguments. Let's go back to the situation in Russia. There are clear arguments in favor of changing the boundaries of the retirement age.

1. The need to change the boundaries of the retirement age in Russia is due to the fact that the population of Russia, like that of other developed countries, is aging. If in 1939 and 1959 the share of people 60 years and older was 6.7 and 9.0%, respectively, then in 2002 (according to the population census as the most reliable statistical source) - already 18.5%. Accordingly, the burden on the working-age population is growing: in 1939 there were 164 people of retirement age per 1000 people of working age, in 1959 - 202 people, and in 2002 - 335 people.

Demographers argue that although life expectancy may remain at the current level or slightly increase, nevertheless, in the coming years, a rapid decline in the absolute number of the working-age population will begin (Russia in front of the face, 2008). Already in the period from 2006 to 2009, the size of this age group has decreased by more than 1 million people. In the next 20 years, according to the official forecast of Rosstat, the drop will be from 9.6 to 16.0 million people. At the same time, the relative share of people of retirement age in the population will increase from the current 21.2% to 28.3–28.5% by the beginning of 2031. The highest rates of aging will occur in the next decade. Accordingly, by the beginning of 2011 there will be 357 people over working age per 1000

people of working age, by the beginning of 2015 - 401–404 people, 2020. - 457–467 people and, finally, by the beginning of 2031 - 498–527 people of retirement age. With the current parameters of the pension system and the labor market, this means a sharp increase in the pension burden, which, presumably, will fall on the working-age population, which will negatively affect not only the financial state of the pension system, but also the prospects for the country's economic development as a whole.

The generally established age for granting old-age pensions, life expectancy at birth and the proportion of the population over 60 years old in Russia and some other countries of the world under the conditions of oral employment, informal agreements on the amount of wages, as well as in small enterprises using a simplified taxation system, hired by individual entrepreneurs, etc.

The full picture of the ratio of workers (in terms of the pension legislation of "insured") and pensioners, according to statistical and departmental reporting, cannot be restored: first, it is extremely difficult to take into account the number of informally employed workers who are not contributors to the pension system at all; secondly, there is a significant proportion of workers who, although they are formally employed, receive part of their earnings (usually large) informally ("in envelopes"), and therefore the payment of the unified social tax (UST) is carried out only on a part of real earnings.

Special sociological surveys come to the rescue. In Russia, one of the most complete sources of such information is a large-scale sample panel survey of the adult population of Russia "Parents and children, men and women in the family and society" Generations and Gender programs. The sample of the G&SL survey, which includes over 11 thousand respondents aged 18–79, represents the population of Russia for the year of the survey (2004 and 2007, respectively) and at the same time includes a significant - over 7.7 thousand people - panel component. From the point of view of the subject of our article, it is important that one of the focuses of the G&SW questionnaire was the issues of employment and participation in the pension system - both of the adult population and pensioners.

Thus, the task of changing the ratio between employed and pensioners in Russia is very acute, and one of the tools for solving it can be raising the generally established and actual retirement age.

Note that Russia is not the only country where the actual retirement age is lower than the officially established one - to one degree or another this is typical for most other countries. This situation is observed in many OECD countries;

the largest differences between the average and official retirement ages are noted in Luxembourg, Belgium, Finland (60 and 65) (OECD, 2006).

However, unlike in Russia, in most of these countries the actual retirement age is increasing. Apparently, this trend will continue: in the world, the actual retirement age will rise, and in Russia, if the status quo in the pension legislation, which regulates the grounds for early pensions, is preserved, it will decrease.

It is obvious that even if the legislative limits of the age for granting old-age pensions are not changed on a general basis, Russia should seek to increase the age of actual granting of pensions on the basis of revising the list of grounds for early retirement.

There is every reason to believe that the upward trend in the duration of education in the future will only increase in connection with the expansion of the availability of higher education in general and the growing second higher education in particular. In any case, this is what global trends testify to.

Let us compare the real situation in 1932, when the standard retirement age was established, with the state of affairs today. In the mid-1930s, higher education was the lot of the elite; male workers entered the labor market on average at the age of 14-16. It was assumed that the end of his working life would occur at the age of 60, since at that time there were no grounds and practice of early retirement benefits.<sup>5</sup>... The duration of the employment period was therefore almost 45 years, after which the employee applied for an old-age pension. Today's male worker enters the labor market at the age of 20-22 and leaves it at an average age of 54 (taking into account the practice of early retirement), thus having worked 32-34 years (and this is only if he does not have significant interruptions in work due, for example, to unemployment or obtaining a second education<sup>6</sup>). In other words, it is only during this period that the male worker acts as a "net contributor" to the pension system. Even if he continues to work after reaching retirement age, he changes his status in relation to the pension system, being both its contributor and its recipient. As a result, over the past years, the period of effective employment for men has decreased by 11-13 years; by almost a third (29%). For women, this reduction was about 10 years: if at the time of the establishment of the retirement age they would have worked from 15 to 55, i.e. for 40 years, now - from 22 to 52, i.e. 30 years. The reduction in the working life of women is 25%.

While carefully guarding the inviolability of the retirement age boundary, we forget about the fact of a reduction in the duration of working life and a change in the ratio "work - pension" in favor of the latter. Today, the average

man works a little more than half of his life (52%), and women - significantly less than half (40%). Of course, labor productivity has increased over the past time, and, accordingly, the socially useful product created by each worker has increased. But after all, social requirements for the pension system have also increased significantly over the past time - today society does not agree to the pension system, which only provides a physiological subsistence minimum, while this was exactly what was discussed during the formation of the pension system in the USSR.

The fact that the Russian state did not dare to raise the retirement age for many decades is associated with weighty demographic, social and economic arguments against raising the retirement age in Russia. To what extent are these arguments substantiated?

Meanwhile, the situation is not so straightforward. Low life expectancy in Russia is influenced by two major factors that distinguish Russia from other countries - high infant mortality and high mortality in male cohorts aged 40–60 years. Sharing the general concern about these extremely negative processes, we still want to draw your attention to the fact that in the context of the pension system in general and when discussing the problem of retirement age, in particular, infant mortality should not be taken into account. Those who died in infancy are not part of the pension system - they do not work and do not apply for a pension. The real participants in the pension system are those who entered the labor market and retired (with the exception of social pensioners).

The second factor is the high male mortality rate at the age of economic activity 40-60 years. Indeed, this is a dramatic feature of Russia, which has been the scourge of Russian demography for many years! However, setting the retirement age for men at 40 would seem absurd! But beyond these age thresholds, the survival rates in Russia are no longer so dramatic and are comparable with many countries of the world (Table 4).

Finally, in the controversy, which most often focuses on the retirement future of men, the question of the retirement age of women remains on the sidelines. The position of women in Russia is fundamentally different. The life expectancy of Russian women is 74 years.

Russian women live on average 2-10 years less than residents of the European Union (EU), and they can apply for an old-age pension 5-12 years earlier. As a result, if in such developed countries as Great Britain, Germany, Canada, USA, Finland, Sweden, where the retirement age of women is 65, women on average receive a pension within 20-21 years, while in Russia the average life expectancy is 55 -year-old woman is 24 years old. It turns out that the average

Russian woman in retirement spends even more time than her peer from some Western country.

Thus, these data indicate that there are reserves for raising the retirement age for women, whose life expectancy is much higher than the current retirement age limits.

2. Equally important is the fact that high mortality goes hand in hand with poor health of the population, so that by the time a person reaches retirement age, a person usually has a bunch of chronic diseases, and often disability. And this is indeed a very significant argument.

According to the World Health Organization, healthy life expectancy in 2002 was<sup>7</sup> at birth was 52.8 years for men and 64.3 for women. The second wave of the GGCS survey, conducted in 2007, showed that about 15% of men and women aged 50–54 and about 25% at the age of 55–59 rate their health as bad or very poor. Almost every second man and 62% of women in the 55–59 age group suffer from some kind of chronic disease; about 15% of men and women of this age suffer from diseases that limit their ability to work. Poor health very often predetermines the termination of work at pre-retirement ages (Roshchin, 1999: 134–150; Sinyavskaya, 2002a), and registration of a disability pension is becoming a significant channel for early retirement. Therefore, an increase in the retirement age in a country with a high mortality rate can indeed lead to an increase in disability.

In our opinion, raising the age for granting an old-age pension should by no means exclude grounds for actually terminating work and retirement on medical grounds, and thus, a real infringement of the pension rights of persons with diseases can be avoided. The main thing that the dynamics of disability warns about is the danger of a sharp one-step increase in the retirement age to the level of European countries, for example, to 65–67 years. But “soft” and But even the statement that society categorically does not accept the idea of raising the retirement age is unequal in different social and age groups of the population. For example, according to the 2007 R&M & JJ data, among the respondents who are most knowledgeable about the pension reform and have a good understanding of the structure of the Russian pension system, the proposal to raise the age was supported by about 20% of the respondents. In addition, when speaking about the public attitude to raising the retirement age, they most often refer to socio-logical polls, in which almost a third of the respondents are already pensioners who retired at a relatively early age, and their opinion is a priori conservative. It is also not surprising that persons of pre-retirement age have a negative attitude towards this prospect, since for them it is an immediate threat. But already rela-

tively young ages are showing a much calmer attitude towards the prospect of raising the retirement age. For example, according to the GGCS data, in 2007 the idea of raising the generally established retirement age in order to improve the state of the pension system was supported by every seventh respondent aged 18-24, every eighth - 25-29 years old and about 7-8% of people 35-54 years (Fig. 2). Speaking about the public attitude towards raising the retirement age, they most often refer to sociological polls, in which almost a third of the respondents are already pensioners who retired at a relatively early age, and their opinion is a priori conservative. It is also not surprising that persons of pre-retirement age have a negative attitude towards this prospect, since for them it is an immediate threat. But already relatively young ages are showing a much calmer attitude towards the prospect of raising the retirement age. For example, according to the GGCS data, in 2007 the idea of raising the generally established retirement age in order to improve the state of the pension system was supported by every seventh respondent aged 18-24, every eighth - 25-29 years old and about 7-8% of people 35-54 years (Fig. 2). Speaking about the public attitude towards raising the retirement age, they most often refer to sociological polls, in which almost a third of the respondents are already pensioners who retired at a relatively early age, and their opinion is a priori conservative. It is also not surprising that persons of pre-retirement age have a negative attitude towards this prospect, since for them it is an immediate threat. But already relatively young ages are showing a much calmer attitude towards the prospect of raising the retirement age. For example, according to the GGCS data, in 2007 the idea of raising the generally established retirement age in order to improve the state of the pension system was supported by every seventh respondent aged 18-24, every eighth - 25-29 years old and about 7-8% of people 35-54 years (Fig. 2). most often they refer to sociological polls, in which almost a third of the respondents are already pensioners who retired at a relatively early age, and their opinion is a priori conservative. It is also not surprising that persons of pre-retirement age have a negative attitude towards this prospect, since for them it is an immediate threat. But already relatively young ages are showing a much calmer attitude towards the prospect of raising the retirement age. For example, according to the GGCS data, in 2007 the idea of raising the generally established retirement age in order to improve the state of the pension system was supported by every seventh respondent aged 18-24, every eighth - 25-29 years old and about 7-8% of people 35-54 years (Fig. 2). most often they refer to sociological polls, in which almost a third of the respondents are already pensioners who retired at a relatively early age, and their opinion is a priori conservative. It is also not surprising

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T.M. Maleva, O. V. Sinyavskaya 18-2425-2930-3435-3940-4445-49% of respondents in this age group Age 2520151050 Abolish the right of some groups

of workers to retire earlier than the generally accepted retirement age Raise the retirement age from which you can receive an old-age pension

The younger the employee, the less fear he has about raising the retirement age. But it is precisely these age groups, and by no means "active" pensioners, who will take on new social obligations if the retirement age is raised and the duration of working life increases. Thus, in this context, the opinion of the young is more significant than the opinion of the elderly.

In addition, we note that the position of Russians on this issue does not differ much from what citizens of other countries think, in which the retirement age has been raised.

But the empirical data (EPD) indicate that employment in pre-retirement ages has been growing in recent years, especially noticeable among women (Fig. 3). Even the economic crisis has not yet led to a significant outflow of persons of pre-retirement and retirement age from the labor market.

However, various surveys of both workers and employers, indeed, often indicate that employers' interest in hiring persons of pre-retirement ages is declining. Here it is legitimate to ask the question: is it not the preservation of a low retirement age that is the reason for infringing on the interests of workers of pre-retirement age to get a job? If the employee retains the right to terminate work upon reaching 55/60 years of age, then the position of the employer who prefers a relatively young employee who can work at the enterprise for a long time with high and increasing productivity is quite understandable. It is possible to invest in such an employee (for example, through a training system) with high expectations of high returns, while an employee approaching the retirement threshold will not have time to return the funds invested by the employer. Thereby,

However, it is already clear that these mechanisms do not work. As before, almost all workers who receive the formal right of retirement exercise it fully and immediately. Incentive schemes for later retirement could hypothetically be effective if there is a high level of public awareness and significant confidence in the future. Both of these conditions are absent in Russia. A very high degree of uncertainty remains due to high mortality risks, instability of the economic situation and limited savings instruments. The population is poorly informed about the content of the pension reform. Finally, the right of Russian pensioners to combine pension and work income also makes incentives less attractive to voluntarily postpone pension applications.

First, no matter how cautiously one treats the observed increase in life expectancy in recent years (from 2006 to 2009, the average life expectancy increased by 2 years - from 66.6 to 68.7 years, including for men by 2.5 years -

from 60.3 to 62.8 years), nevertheless, this process has begun, and according to this logic, the retirement age can be increased.

Secondly, if we focus on the growth of life expectancy by 5-10 years, then it should be noted that if this cherished goal is achieved, the burden of the pension system by the elderly will increase at a rate much higher than the growth rate of income of the pension system, which will only aggravate the pension crisis. spheres.

To avoid this, the logic of practical actions must be different - it is necessary to raise the boundaries of the retirement age against the background of the trend towards an increase in life expectancy. And it is at this historical point that we are now.

Thus, there are few reasons that would force us to abandon raising the retirement age, while the financial arguments in favor of such a measure remain strong and their weight is growing (Gurvich, 2010). Consequently, instead of exhausting political debates around the question "is it necessary or not?" much more appropriate expert and public discussion of the question "how?" The most productive thing today is looking for options for the least painful way to raise the retirement age.

The first measure, which is practically obvious to everyone, and even has no obvious opponents, is the reform of early pensions and, thereby, raising the actual retirement age. This step is justified even within the current limits of life expectancy.

The second solution also fits into today's demographic realities - the gradual equalization of the retirement age for men and women. Almost all countries of the world have already taken this step. In today's Russia, there are also conditions for such an alignment.

Finally, a problem that cannot be avoided is a direct increase in the generally established retirement age, including for men. However, we cannot talk about its one-time increase. Of course, it is necessary to take advantage of the experience of other countries that have applied time-stretched schemes. For example, this measure should be addressed to employees who are at least 5, and preferably 10 years old, before retirement age. The rate of increase should not exceed 4-6 months per year. If you follow such a scheme, it becomes obvious that the procedure for raising the retirement age should begin now, since reaching the 60-year threshold for both sexes may take 15 to 20 years, and its increase to 62 will require another 4-8 years. If you refuse to raise the retirement age now,

**References:**

- Gurvich E.T.** (2008): Priorities of the new stage of pension reform // SPERO - Social Policy: Expertise, Recommendations, Reviews. No. 8.
- Gurvich E.T.** (2010): Reform of 2010: have the long-term problems of the pension system been solved? // Journal of the New Economic Association. No. 6.
- Demographic Yearbook (2009): Demographic Yearbook of Russia, 2009. Stat. collection. Moscow: Rosstat.
- Zakharov S., Rakhmanova G.** (1997): The Demographic Context of Pension Security: Past and Present. In the book: "Modern problems of the pension system: comments of economists and demographers" / Ed. T. Maleva. Moscow: Carnegie Moscow Center.
- Maleva T.M., Sinyavskaya O.V.** (2005): Pension Reform in Russia: History, Results, Prospects. IISP Analytical Reports Series. M.: Pomatur.
- Population and Society (2009): Data on life expectancy at birth. [Electronic resource] Demoscope-weekly. Electronic version of the Bulletin "Population and Society". Access mode: <http://demoscope.ru/weekly/app/app4011.php>, free. Language. Russian (date accessed: March 2010).
- Pension reform in Russia (1998): reasons, content, prospects / Ed. M. Dmitrieva and D. Travina. St. Petersburg: NORM.
- Russia in the Face (2008): Russia in the Face of Demographic Challenges. Human Development Report in the RF. M.: UNDP.
- Roshchin S.Yu.** (1999): Labor activity of the older population // Demographic and socio-economic aspects of population aging (second Valentyev readings): collection of articles. articles. M.: Dialogue-MGU.
- Sinyavskaya O.V.** (2002a): Prospects for raising the retirement age in Russia. ASPE Scientific Report Series. No. 9.
- Sinyavskaya O.V.** (2002b): Assessing the Economic Impact of a Possible Change in the Retirement Age. Abstract for the degree of Candidate of Economic Sciences. M.: VTsUZh.
- Sonin M.Ya.** (1980): Population Development: An Economic Aspect. Sat. works. M.: Statistics.
- Uralanis B.TS.** (1974): Problems of the Population Dynamics of the USSR. M.: Science.
- Economic activity (2010): Economic activity of the population, 2010: Stat. collection. Moscow: Rosstat.
- Barr N.** (2000): Reforming Pensions: Myths, Truths, and Policy Choices. Working Paper No. WP / 00/139. IMF. August.

- OECD (2006): Live Longer, Work Longer. Paris: OECD.
- Ofer G., Vinokur A.** (1985): Work and Family Roles of Soviet Women: Historical Trends and Cross-Section Analysis // Journal of Labor Economics. Vol. 3. No. 1. Part 2: Trends in Women's Work, Education and Family Building. P. S328 – S354.
- Social Security Programs (2008a): Social Security Programs Throughout the World: Europe, 2008 [Electronic resource] Social Security Administration. September. Available at: <http://www.ssa.gov/policy/docs/progdesc/ssptw/2008-2009/europe/index.html#preface>, free. Title sekraon. Language. English (date accessed: March 2010).
- Social Security Programs (2008b): Social Security Programs Throughout the World: the Americas, 2007. [Online] Social Security Administration, March. Access mode: <http://www.ssa.gov/policy/docs/progdesc/ssptw/2006-2007/americas/index.html>, free. Title from the screen. Language. English (date accessed: March 2010).
- Social Security Programs (2009): Social Security Programs Throughout the World: Asia and the Pacific, 2008 [Online] Social Security Admin
- T.M. Maleva, O. V. Sinyavskistration. March. Available at: <http://www.ssa.gov/policy/docs/progdesc/ssptw/2008-2009/asia/index.html>, free. Title from the screen. Language. English (date accessed: March 2010).
- United Nations (2008): United Nations, Department of Economic and Social Affairs, Population Division, World Population Prospects: The 2008 Revision Population Database [Electronic resource] Database. Access mode: <http://esa.un.org/unpp>, free. Title from the screen. Language. English (date accessed: March 2010).
- Zaidi A., Whitehouse E.** (2009): Should Pension Systems Recognize “Hazardous and Arduous Work”? // OECD Social, employment and migration working paper No. 91. August.

## VOCATIONAL EDUCATION: REFORM AGAIN

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*Klyachko T.L.*

*Center for Continuing Education Economics of the Academy of National  
Economy, Moscow  
E-mail: kilacho@bk.ru*

*The issues that are now facing the vocational education system, with all the diversity, can be reduced to two: 1) does the structure of personnel training correspond to the demands of the labor market; 2) is it possible to ensure the transition to an innovative economy on the basis of the existing personnel base, to modernize not the education system, but the country.*

The situation in vocational education has been difficult for several years. The demographic decline already in 2003 reached the system of primary vocational education. Since then, the number of students in NGOs has decreased by more than 37%, and graduates by 30%. It is not surprising that business is sounding the alarm - there seems to be a really shortage of workers. Given the fact that the number of the working-age population in Russia is beginning to decline, there is a double cause for unrest. And Mikhail Prokhorov at the meeting of the State Council on Education held on August 31, 2010 says that the vocational education system does not meet the demands of the labor market - only 10% are graduates with primary vocational education, 20% - with secondary education and 70% - with higher. But the opposite is necessary - 80% with primary and secondary, and only 20% - with higher.

However, according to the Federal State Statistics Service, in the 2009/10 academic year, graduates from NGOs amounted to 538 thousand people, vocational education - 631 thousand people, HPE - 1442 thousand people. Thus, we find that university graduates make up a little more than 55%, and that of NGOs and vocational schools a little less than 45%. The proportion is normal for post-industrial countries.

Now let's see what happens to the graduates of the NGO. According to sociological research, 25% of them enter the labor market (these are mainly workers in the service sector and trade - hairdressers, waiters, cooks, salespeople), 16% are waiting for conscription, about 53% want to continue their studies in vocational schools and universities , and another 6% intend to immediately change their profession. Accordingly, 59% already after leaving a vocational

school or lyceum do not intend to work in the profession they have acquired, another 16% of graduates - those who go to the army will not always work in the field for which they were trained. So, the efficiency of the NGO system is currently about 25–30%, i. E. Steam locomotive efficiency. And the transfer of NGO institutions to the regional level, when it was assumed that now they would be more focused on local labor markets, As we can see, it did not give the desired effect. And, what is more important, I could not give it, since the matter is not in what budget the given level of professional education is financed, but in the army conscription and the ideas of young people about a worthy job. Research by the Levada Center in recent years has shown that only 6% of respondents aged 15–35 consider the worker's profession attractive.

In VET, the situation is not much different from the situation in primary vocational education: 76% of those who graduate from secondary vocational schools intend to continue their studies, while 91% - in universities. In recent years, in connection with the full-scale introduction of the Unified State Exam, the number of VET institutions began to grow, despite the continuing decline in the contingent. They began to be created at universities so that their graduates could immediately be enrolled in a higher educational institution, bypassing the Unified Exam.

All these years we have constantly talked about the fact that more than half of the graduates of universities do not work in their specialty, not paying special attention to the fact that an even more serious situation has already developed in primary and secondary vocational education.

The second question is - can the vocational education system provide personnel for the modernization of the economy, innovative production? In Russia, there are universities and vocational schools that train personnel whose qualifications are at a high level or can be brought to such a level. The priority national project "Education" made it possible to allocate about 10% of educational institutions of higher professional education, secondary vocational education and NGOs, which have the ability to implement innovative educational programs, provided them with an update of the material and technical base. But their teaching corps has largely remained the same.

At the same time, the material base of other educational institutions of vocational education is outdated, aging and obsolete.

delivery building. Recently, the rector of a famous Russian university said with a sad smile: "Well, 60 years old is still a young professor!"

Another problem of universities, vocational education institutions and NGOs is that the majority of their teachers either still, or already "do not know

life." More precisely, they know that life and those industries that can hardly be called modern. They can teach those who should support what was created 20-25 years ago, but they either do not know anything about innovations, or they know by hearsay.

Ya. Kuzminov and I. Frumin in their article "Professional Education: Russian Master Plan" note that "with the help of competitive mechanisms, a group of research universities has been formed with a clear goal - to become the locomotives of innovative development. More than 100 billion rubles have already been allocated for the development of this network. But among this money there is no funds for actual research, which should become the basis for new technologies. " But the question is not only about money, but above all, who will conduct this research, even if funds are allocated for this purpose? The state of Russian academic science has long been alarming, but the state of university science is by no means better, if not worse: since Soviet times, it has been inferior to academic science. Yes, measures are being taken to change the situation, much is said about the invitation to research universities of leading scientists, including foreign ones. But the leading scientists are successful people, they have the funds for research, and they are unlikely to en masse want to move to universities, even if they received the status of NRU.

In the systems of CVT and VET, the problem of personnel is no less acute. Rosstat data on wages in primary and secondary vocational education for January – May 2010 are disappointing; it is 55.9% of the average for the Russian economy in NGOs, and 74.1% in secondary vocational education.

It is unlikely that this level of remuneration can lead to a significant change in the teaching staff of institutions of primary and secondary vocational education. Therefore, NGOs and VETs will not train workers for an innovative economy, but those they can - with the available staff and on the material and technical base that they have. It seems that it is easier to renew the material base than to change the personnel corps. The proposal voiced at a meeting of the State Council from the lips of the Governor of Kress that university professors go to work in NGOs and VET institutions, since the number of students will be greatly reduced in the coming years and more than 100 thousand teachers will be released, most likely it will not find support in the university environment.

To improve the situation, it is necessary to have sufficiently reliable forecasts of staffing requirements. Now they are gone. The Ministry of Economic Development develops forecasts of the socio-economic development of the Russian Federation for three years, while the main parameter of these forecasts is the price of oil, and not structural changes in the economy. And it is quite diffi-

cult to foresee these shifts in such a short term. Thus, we get: forecast - separately, innovations - separately and separately - determination of the structure of personnel training. In order for this to converge into a single whole, it will be necessary to change the forecasting methodology, involve regions and business in this matter, take into account migration flows both within the country and from abroad, and also increase the forecasting time by at least 2– 2.5 times.

The transformation of the structure of training in primary, secondary and higher vocational education should be based on a long-term investment program agreed by the regions, business, and the education system, which implies mutual obligations. In addition to the investment program, a retraining program for the vocational education system is needed, based on fundamentally new programs. If you implement this entire chain, then the output can be a system of continuous professional education, which has been so much talked about recently, but which no one has seen yet.

An innovative economy, in contrast to an industrial one, requires different skills from an employee. It is technologically complex and expensive, and, accordingly, assumes that the employee will be socially mature, aware of all the risks and responsibilities associated with the use of expensive equipment. This is not a teenager sixteen or seventeen years old, this is a man in his twenties. It is this moment that should determine the transition of the school education system to the twelve or even thirteen years. It is hardly possible to reform vocational education without reorganizing general education. Training of workers for innovative industries should be deployed on a different system of vocational education. Admission to a vocational school should not begin at the age of 15, as is the case at present, but at 19–20.

The main difficulty in the modernization of education, which we have observed over the past ten years, is the lack of comprehensiveness of measures, on the one hand, and poor consideration of the consequences and risks, on the other. In complexity leads to a sharp decrease in the effectiveness of those measures that are being implemented, as well as to obtaining results that were "not expected". As a result, society becomes disillusioned with reforms, treats them with apprehension and even becomes immune to innovations. And this, by the way, is very harmful to the perception of an innovative economy. The second point is to embellish the final result. It is seen in rosy tones, and risks and negative consequences are obscured and downplayed. As a rule, we first get involved in a battle, and then we begin to calculate the consequences and real resources required for transformation. Due to the inertia of the education system, negative phenomena do not appear immediately, however, as well as positive ones. And

this complexity of modernization of the education system in general, and vocational in particular, cannot be ignored.

The complex and contradictory situation in higher education in Russia is largely due to the preservation of the sectoral approach to solving problems, an attempt to breathe life into an industrial model that is irrevocably becoming a thing of the past. This model is inextricably linked with the administrative system of university management, the appointment of rectors, it is aimed at patching holes, and not at strategic prospects and not at creating conditions for creativity and professional growth. To overcome the intellectual and technological backwardness of Russia, it is necessary to build up the potential of creativity. Creativity is a special dimension, for its formation special conditions are needed, first of all, freedom of creative search, research, freedom to think, design, try, make mistakes ... It's not that the knowledge of university graduates working in the industrial model is weaker, than creative. The fact is that they have - "the sky is as tall as the tail of a dog." This figurative expression of the Khanty accurately reflects the essence of the problem - is it possible to move to an innovative economy with an industrial model of universities?

For all the similarities between the decisions made in Europe and Russia, the principles on which these decisions are based often turn out to be opposite. In moving to the new Performance Funding Models, European countries have based their actions on a concept that maximizes support for strategic decisions while minimizing government interference in university affairs. It was widely recognized that autonomy is becoming one of the main factors contributing to improved quality and competitiveness. Autonomy is expressed in the fact that universities own assets, decide investment issues themselves, university management is fully responsible for financial activities and exercises its control, including long-term programs, hires university staff and is responsible for them, pays severance pay and pensions, as well as unemployment benefits. Outwardly, Russian laws on autonomy are very similar to those established in European countries, but in essence they do not provide the promised freedom in strategic decision-making and resource allocation, do not protect against petty tutelage and vigilant control, and do not guarantee sustainable long-term development. Even the recently adopted FZ-83 on the legal status of budgetary institutions, already at the stage of preparation for its approval, obliges universities (as well as budgetary institutions in other areas) to annually develop and approve in the ministry with the Deputy Minister a plan of financial and economic activities for fractional items of the economic classification of expenditures. those. actually claim the same Outwardly, Russian laws on autonomy are very similar to those

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In the course of an empirical study of the economic behavior of universities in the context of reforms in the period 2006-2009. the following trends were identified:

- rapid extensive financial growth; concentration of financial resources in large and super-large universities; the formation of giant universities; polarization of the economic positioning of universities.

In 2006, there were only 3 universities among 332 Rosobrazovanie universities, in each of which the amount of budgetary funding exceeded 1 billion rubles. Their share in the total amount of funding was only 2.5%. In 2009, there

were already 28 such universities, and their share in the total funding increased to 31.7%. The number of universities with funding of more than half a billion rubles a year has increased in a similar way. In 2006, there were 14 such universities, and their share in the total volume of funding was 14.7%. In 2009 there were 72 of them, and the share increased to 30%. Therefore, today 100 large universities of Rosobrazovanie draws on more than 60% of the total funding. However, this concentration of financial resources did not at all lead to systemic changes. We are witnessing the lag in institutional reforms, the lack of scale of the existing project management in large universities, the growth of financial resources, low sensitivity of universities to external threats: financial and economic crisis, demographic decline, decrease in effective demand, especially in the regions of Russia. But the critical situation is that there is a freeze in the development of human resources and outdated management technologies. We called this the Leviathan effect: as you know, the Leviathan is structurally the same fish, but only huge and vicious. The "short" money received by the universities according to the estimate cement the industrial model of universities, they cannot play the role of a catalyst for reforms. The autonomy resource is not used. that there is a freeze in the development of human resources and outdated management technologies. We called this the Leviathan effect: as you know, the Leviathan is structurally the same fish, but only huge and vicious. The "short" money received by the universities according to the estimate cement the industrial model of universities; they cannot play the role of a catalyst for reforms. The autonomy resource is not used. that there is a freeze in the development of human resources and outdated management technologies. We called this the Leviathan effect: as you know, the Leviathan is structurally the same fish, but only huge and vicious. The "short" money received by the universities according to the estimate cement the industrial model of universities, they cannot play the role of a catalyst for reforms. The autonomy resource is not used.

For education, management methods are more adequate, which are characteristic of modern network management, rather than a separate institution or organization. This is much more complicated, since it requires a multidimensional focus, a flexible combination of the principles of administrative leadership, indirect economic and financial impact, and delicate incentives. The conceptual basis of this approach is the theory of signals and filters. University management is focused on activity principles, on actualizing the future in the present, on what is commonly called action-education & action-research

To do this, an educational institution, of course, must have the freedom to pull and transfer resources, and master fundraising technologies. This does not

abolish the principles of transparent budgeting and public control, but, on the contrary, forces us to use these mechanisms as efficiently as possible. Currently, the most successful in terms of ensuring the innovative nature of the development of educational activities are those educational institutions in which processes of three types are simultaneously developed:

educational technologies that ensure the integration of design and research tasks into the educational process;

projects related to the development of various technologies, sectors and sectors of the economy;

research of both fundamental and applied nature.

The effective combination of all three processes in the creation and updating of educational programs ensures their competitiveness.

In the context of conflicting signals from the labor market, vocational education has been oriented towards consumers of its services and training in those specialties that consumers want to receive. Thus, young people and parents began to combine two roles in relation to the vocational education system: they act as both its consumers and customers. The education system is locked in to their needs and is poorly guided by signals from the labor market. The lack of established feedback channels between the education system and labor markets resulted in inconsistencies in the actions of the state, the educational system and employers. Employers do not have strategic plans for the development of their business for ten years ahead in order to act as a responsible customer for the graduation of students in their specialties. They know what they need today or tomorrow, but not ten years later. Professional standards, which could become the basis for new educational standards, are being developed extremely slowly, and they are not yet available for key sectors of the economy. In such conditions, the area of permissible solutions is outlined by a well-thought-out policy of supporting partnerships between universities and the business sector - companies, corporations, firms, organizations of the non-profit sector, as well as by the high rate of updating of curricula that guarantee the quality of education that meets the modern challenges of the economy and society, and not at all by guessing demand for professions in 5-10 years. Yesterday you could hear about the uselessness of engineers, and today - about the overproduction of economists and lawyers. To avoid such an imbalance, you need to invest in the students themselves, in the quality of education, in new curriculum development, based

on scientific research. The creative potential of future university graduates is the main guarantee of creating new high-quality jobs.

In modern conditions, the demand from students is presented not only for the knowledge that is offered by universities in the form of courses, disciplines and subjects, but also for those competencies and cultural standards that the process of learning and staying in the atmosphere of the university gives itself. We are talking about large-scale training for the service sector, which in the new economy makes new demands on the general cultural level of workers. In order to ensure the development of this sector of vocational education and at the same time give impetus to improving quality, it is necessary to move from the management of educational institutions to the management of educational programs. Studies show that the younger generation of Russians is highly mobile: many of them change jobs after graduation within two to three years. Joining a new team, young people create a new point of development for themselves, move easily if they see a perspective. Mobility is a resource for development, as a result of which a generation is formed that significantly differs from their parents in their great social experience. Today, significant creative potential is concentrated in universities, and not only in elite ones, but in those that are open to new things and develop dynamically. Horizontal mobility and the movement of human capital necessarily change its quality, make it possible to quickly displace the obsolete, master the new. Today, significant creative potential is concentrated in universities, and not only in elite ones, but in those that are open to new things and develop dynamically. Horizontal mobility and the movement of human capital necessarily change its quality, make it possible to quickly displace the obsolete, master the new. Today, significant creative potential is concentrated in universities, and not only in elite ones, but in those that are open to new things and develop dynamically. Horizontal mobility and the movement of human capital necessarily change its quality, make it possible to quickly displace the obsolete, master the new.

A modern university can be viewed as a micro-model of a new society with a new economy, as if an incubator of a society based on knowledge. Academic freedoms, student self-government, the organization of research teams, including both professors and students on the principles of project self-organization, the dynamism of the rapid generation and development of new knowledge and competencies, the ability to concentrate intellectual and financial resources on key points of growth - all these are the desirable characteristics of a modern university. ... The same description can be applied to a knowledge-based society.

Therefore, by giving universities the freedom associated with long-term, self-directed funding mechanisms,

Today the fact that the Russian higher education system is in a state of deep crisis no longer requires proof. A huge number of Russians have a university degree, but many of them do not even know how to write competently, let alone more complex forms of education. How could this have happened? Is the transformational recession, underfunding of education, or some exogenous reason to blame for this?

In our opinion, this phenomenon is based on the prevailing practice of mass, if not total, higher education in the country. This practice itself is the result of a fundamental error. We are talking about the ideological setting that the educational services market should strive for equilibrium. Indeed, in the absence of any restrictions, the supply of educational services grows due to the increase in the number of universities and the expansion of the scale of their activities. This, in turn, leads to a drop in the cost of education in universities, which leads to its maximum availability. What's wrong with that?

Today, a diploma is no longer a source of positive information. For example, what can a certified university graduate do? As it turns out, having an educational certificate does not give any guarantees that he can do anything. This leads to complete disorientation of employers: they do not know who should be hired and who should not. After employment, almost all graduates require not just completing their education, but serious retraining or training from scratch.

In an era of innovation, the main resource is the workforce capable of generating that innovation. Who will do this in Russia? The answer seems obvious: people with higher education or advanced degrees. However, the overwhelming majority of them cannot do this. But at whose expense, then, will the progressive evolution of Russian society be carried out?

The higher education system is incapable of solving this problem. What is the way out?

In our opinion, it is necessary to quickly build a system for monitoring the quality of education with a strict linking to it of the mechanism of financial support for universities. This will lead to the fact that universities that are outsiders of the education market will gradually self-liquidate (or will they be liquidated?). Moreover, we are talking about reducing their number not by 10-20%, but several times. Such a measure will lead to a corresponding increase in the competition, which, in turn, will allow universities to select applicants. Thus, it is necessary to make a conscious movement towards increasing the imbalance in the educational services market, which will increase the tension of the system

and its innovative potential. At the same time, the imbalance will help to maintain high earnings of the teaching staff, creating motivation for work in the field of education. Large contests will make it possible to create student reserves and, at their expense, implement a policy of large student dropouts in the learning process. At the same time, all training can become free, i.e. at the expense of the state; commercial education fees should rise substantially. All these measures will make it possible to control the quality of education both on the part of students and their parents and on the part of teachers.

How reasonable is such a policy of maintaining the higher education deficit seems to be?

First, the available figures show that the achievement of complete equilibrium in this market can completely and finally destroy the domestic education system. So, in terms of the saturation of the society with students, Russia is one of the world leaders. For example, in 2009–2010. Russia had 52 students per 1000 population (Federal Service, 2010), which is equivalent to the level of Australia and slightly below the level of New Zealand (58) and the United States (59). But these three countries are leaders in the export of education, which explains their exaggerated performance. The same states as Great Britain (39), France (36), Switzerland (28) and Japan (28) lag significantly behind Russia - 1.3-1.9 times. However, these figures cannot be directly compared. For example, according to our estimates, in Australia, the share of foreign students among students is 20.3%, and in the UK - 21.8; in the USA in the specialties "Business" and "Management" their share is also more than 20%; in Russia this

the value is negligible. On postgraduate programs in Britain, the share of foreign students in the specialty "Business and Administration" is 83%, in sociology and social studies - 73, in biology - 72, in technical disciplines - 621... Obviously, the pumping up of quantitative indicators in our country occurs due to a decrease in quality. But the figures given are far from the limit. Statistics show that in Russia the pent-up demand for higher education continues to grow, increasing from 1.72 people per place in 1993 to 2.08 in 2008 (Federal Service, 2010). Consequently, in order to satisfy all the current demands for education in Russia, it is necessary to increase the number of universities and students, if not twice, then at least by 25-30%, which is beyond reason. In this case, we risk getting an already open trade in diplomas (and not veiled, as now).

Second, the equilibrium of the market is tantamount to the complete impoverishment of higher education. Today, financing of higher education in Russia is noticeably worse than in developed countries. For example, the share of such financing in GDP in France is 5.6%, and in Russia - 4.1% (Federal Service,

2010). However, when recalculating the indicator of the provision of the population with students, France finances its higher education almost twice as much as Russia ([5.6: 37] / [4.1: 52] = 1.97). If we maintain the current size of Russian higher education, then, in order for its funding to meet the French standard, the share of GDP allocated to education should be increased to 8%. Such a figure was recorded only in Denmark, but for Russia it is beyond the limits of the possible (Federal Service, 2010).

Third, the maintenance of artificial market imbalance has positive examples in other industries. For example, many banks carry out the so-called credit rationing, setting the interest rate for the loan deliberately below the equilibrium one. This allows them to create excess demand for their product and, due to this, move on to strict selection of their customers according to the level of reliability. Thus, banks deliberately go to the loss of income in order to reduce risks. In fact, they are losing money today in order not to lose it tomorrow; they sacrifice tactical interests in order not to lose strategic positions. As for higher education, it has always been characterized by a system of rationing, which consists in maintaining a reasonable competition for higher educational institutions. The only question is which competition can be considered "reasonable". Today, the availability of education in Russia, when even the weakest applicant can graduate from a university, has led to a decline in its quality and prestige. This is in stark contrast to the experience of developed countries. For example, the competition for a master's program at the London School of Economics is up to 1000 people per place, while in leading Russian universities, even for a bachelor's degree, there are about 100 people; the competition for the Russian master's program is either absent at all, or is at the level of several people per place. At the same time, leading Western universities do not go for a primitive increase in the cost of education in order to cut the excess demand for their services and balance the market. On the contrary, they maintain this position in order to be able to control the quality of applicants and students. led to a decline in its quality and prestige. This is in stark contrast to the experience of developed countries. For example, the competition for a master's program at the London School of Economics is up to 1000 people per place, while in leading Russian universities, even for a bachelor's degree, there are about 100 people; the competition for the Russian master's program is either absent at all, or is at the level of several people per place. At the same time, leading Western universities do not go for a primitive increase in the cost of education in order to cut the excess demand for their services and balance the market. On the contrary, they maintain this position in order to be able to control the quality of applicants and students. led to a

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Thus, the key to an effective system of rationing for higher education is the imbalance in the market for the corresponding services. Otherwise, the emergence of an intellectual elite capable of generating and implementing technological and social innovations is blocked in the system. This position is a special case of the well-known thesis of I. Prigogine that only those systems that are in a state far from equilibrium evolve.

The modernization of the sphere of higher education should go in two directions - its rigid rationing and the normalization of attitudes towards it. Both require very careful action, but there is no longer any doubt about their necessity. Let us emphasize that all these measures should be aimed not at undermining the demand for education as such, but at undermining the desire to receive a degree without a corresponding desire to study.

Rationalization of education, in our opinion, should be structured as follows. First, to tighten the system of quality control of education at universities, including not only the quality of the courses taught and the professionalism of lecturers, but also ergonomic indicators when universities that are not located in

the rightplace must be deprived of their licenses and accreditation. Secondly, the system of state-recognized diplomas should be abandoned, which in one way or another equalizes all universities. It is necessary to move on to assessing the quality of a specific diploma, depending on the prestige and reputation of the institution that issued it. Thirdly, it is necessary to launch a large-scale work on the systematic compilation of university rankings. This work involves changing the role of ratings, their quality and the system of interaction between rating agencies, universities, government and employers. Fourth, the state should provide substantial financial support to a limited number of advanced universities (for example, the first 50 universities in the national ranking of universities). It is possible to use a system of decreasing coefficients for the participation of the state in case of lowering the place of a university in the ranking.

This entire system should lead to the fact that universities-outsiders will be left without government support, and without it and without a worthy position in the rankings, such universities will be of no interest to anyone. Those who want to buy their diplomas on the cheap can do this, but the effect of such a deal for them is likely to be dubious. It is possible that in the future it will be necessary to expand the higher education system again, but for this, the appropriate conditions must mature.

**Literature:**

**Federal Service (2010):**Federal State Statistics Service. [Electronic resource] Official site. Access mode: <http://www.gks.ru>, free. Title from the screen. Language. Russian (date accessed: May 2010).

## ECONOMIC SCIENCE IN RUSSIA: THE COSTS OF GLOBALIZATION AND REFORM OF THE RAS

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*Polterovich V.M.*

*CEMI RAS and MSE MSU, Moscow*

E-mail: poltemvm@bk.ru

### 1. Costs of globalization

The thesis that science is one is just as common as the claim that the perfect market is efficient. However, economists are well aware that even in a perfect competitive market left to its own devices, market power is inevitably formed, which generates inefficiency. This is why antitrust regulation exists in all modern economies.

Markets for education and research services are imperfect: language and cultural barriers, travel costs and other frictional factors contribute to their fragmentation. But if one of the countries is able to offer researchers significantly better conditions, then there is no chance of the formation of modern Austrian or Lausanne schools. By utilizing the results of talent attracted from around the world, a monopoly country has been able to maintain power in the research and education markets for decades.

The unity of science, achieved through its concentration in the United States, has mixed consequences for the rest of the world. On the one hand, the knowledge and technological solutions generated in America are in demand on all continents, on the other hand, the needs of the United States have a significant impact on the formation of programs, even in the field of fundamental research. This is especially true for applied development. And it is especially acute in the social sciences.

Today the whole world learns from basic economic textbooks, focused mainly on the problems of the most developed.

Talents who come from Asia, Eastern Europe and Africa face a dilemma: whether to join the mainstream or give up the hope of getting into a high-level university. Even Europeans feel the need for their own version of basic economic disciplines. It is not for nothing that the textbook on macroeconomics by M. Burda and Ch. Viplos, published in 1998, contained a subtitle: "European text".

Insufficient attention to the problems of developing countries is reflected in the quality of international expertise and the effectiveness of international assistance, and the brain drain and the absence of national schools make underdevel-

oped countries defenseless against the authority of Harvard graduates, even if the theoretical basis of their recommendations does not extend beyond the first theorem of general welfare. It should also be borne in mind that due to insufficient development, "scientific expertise" often becomes a hostage of political interests.

Three important conclusions follow from the above.

First, the development of Western economic science is necessary, but not sufficient for the formation of a qualified expert community in Russia. Straightforward borrowing will only exacerbate the emerging tendency to split between theorists who believe that publication in a top journal gives them reason to consider themselves experts in economic policy, and analysts who despise theory for its inability to automatically generate correct and practical solutions. Inviting Western specialists is extremely useful, but it does not solve the problem. For the cultivation of qualified experts, it is necessary to create a national economic school<sup>2</sup>. This is the most difficult long-term task, but it is necessary to start solving it now.

Second, attempts to copy the structure of the US research and education sector are doomed to failure<sup>3</sup>. American universities act as powerful pumps for talent from every continent, and a network of talent pipelines is built into the global architecture of the global science sector with its rankings, awards, and single markets for young doctors to maintain American leadership. The success of American policy in science and education is based entirely on the economic superiority of the United States.

Third, the formation of an expert community based on the combination of theoretical knowledge and experience is possible only with serious support from the state, which mitigates the consequences of the brain drain.

## **2. Reform of the R&D Sector: What's Happening?**

In a short note, there is no room for a detailed description of the changes that are taking place, and besides, the scale of losses suffered by the Russian sector of science and education, and the recent steps of the Russian government aimed at increasing its funding, are described in many works (see, in particular, articles A.E. Varshavsky and I. Abankina in this issue). Three main strategic characteristics of the measures taken can be identified:

- a) the strategy of financial support is "focal" in nature;
- b) the government seeks to create competition with the Russian Academy of Sciences by supporting the formation of independent research centers and stimulating research at universities<sup>4</sup>;

c) the government continues to strive to create incentives for modernization for educational and scientific organizations, selecting projects proposed "from below", without even trying to act as a coordinator of a single project for modernizing the sector.

As a result, the diagnosis of the unsatisfactory state of education and science has not been made, the global goals and objectives of the set of measures taken have not been determined, the justification for the measures taken and the forecast of the expected results are absent. A reform organized in this way can only be effective as a result of a miraculous coincidence.

The risks associated with the implementation of the measures taken are obvious. Here are some examples.

Focal modernization can be effective only if the mechanism of spreading the achievements obtained in the "hotbeds" throughout the country is involved. Otherwise, "hotbeds" deplete the environment, attracting the best human resources with more comfortable conditions. The integral results of the network of regional monopolies built in this way may well turn out to be negative.

With the current workload of teachers, the vast majority of them will not be able to do serious research, no matter how much they pay. Is the government ready to create such comfortable conditions in universities to prevent the best brains from being drained into business and abroad? We are talking not only about material support, but also about the research infrastructure, the possibilities of inviting colleagues, participation in conferences and seminars, etc. And if the answer is no, then what are the goals pursued by the Ministry of Education and Science, opposing universities and the Russian Academy of Sciences?

It should be emphasized that at present the Russian Academy of Sciences and educational institutions complement each other. Researchers have, perhaps, the only possible privilege for a backward country in comparison with their American colleagues: the right to assign themselves the amount of teaching load. At the same time, the majority of doctors of sciences and many candidates teach in educational institutions, supervise undergraduates and graduate students, and participate in joint research. They receive far fewer full-time teachers of similar qualifications. Thus, the education sector is partially financed through the RAS. Can it be argued that a violation of the existing balance will have a positive effect?

I would like to understand what goals are being pursued by the reorganization of science and education. Are we striving to improve the international rankings of our universities or to their effective participation in solving the problems of modernizing the economy? Contrary to the tacitly accepted assumption, they

are not the same thing at all. It is hoped that solving the second problem will bring us closer to solving the first. But as a result of the focus on high scientific positions in the world, we may well produce a couple more Nobel laureates, which is almost as honorable for the country as the first place of its football team in the world championship. But ... does not affect the well-being of its citizens too much.

In conclusion of this section - my answer to a naturally arising question: if we do not rely on innovation, why do we need fundamental science? The fact is that the task of effective borrowing and a gradual transition to an innovative path of development is a fundamental complex problem that requires broad participation of representatives of both social and exact sciences, a gradual increase in the role of fundamental research. Russia is in a unique situation: for historical reasons, the level of our science is significantly higher than the scientific level of countries with similar indicators of well-being. This gives us additional chances of success if we have a rational long-term strategy that timely corrects "short-sighted" market signals.

### **3. Towards the modernization project of the Russian Academy of Sciences**

It is customary to speak of the RAS as a ministry of science. This is true, but just as true is another thesis, seemingly contradicting the first: RAS is an element of civil society not controlled by the government. To be convinced of this, it is enough to recall Academician Sakharov and the consolidated protest of Academicians against shock therapy in 1992. Of course, the authorities may not like such duality.

The second reason to attack RAS is the desire to blame it on the lack of innovation. This accusation has no real basis: the Russian economy is not yet ready for innovative development<sup>5</sup>. But you want to find someone to blame, otherwise you will have to admit that the task was set incorrectly from the very beginning.

But the third reason for attacks on RAS should be considered in more detail. The organizational structure of the RAS leaves much to be desired. In my opinion, the leadership of the Academy made a big mistake by not yet proposing a program for its improvement. Below I list some of the measures that could become part of a future project that responds to the fundamental challenges facing RAS.

#### **The problem of the age structure of the RAS**

The following proposal, up to terminology and small details, belongs to Academician R.I. Nigmatulin 6.

A. Along with the status of a full member and a corresponding member of the RAS, it is proposed to introduce the status of an associated member of the RAS.

The Associate Member is elected by the corresponding branch of the Russian Academy of Sciences for a period of 10 years; at the time of nomination, a candidate for associate membership must be no more than 45 years old. Each branch of the Russian Academy of Sciences determines the criteria, the fulfillment of which is necessary for the nomination to associate members<sup>7</sup>. An associate member is awarded a scholarship. Associate members have an advisory vote at all meetings of the relevant sections, divisions and at general meetings of the Russian Academy of Sciences. It may be advisable to allow associate members to participate in the election of corresponding members; their vote could be counted with a reduced weight (e.g. 1/3).

B. It is advisable to develop a system of incentives (increased salaries, positions of honorary director, chief consultant, etc.) encouraging resignation from the management positions of the RAS and RAS institutes upon reaching the age of 65. (Proposal (B) was put forward in different versions more than once.)

**Strengthening the requirements for candidates for membership in the Russian Academy of Sciences**

Here is another proposal of Academician R.I. Nigmatulin (with a slight clarification), which I would like to support 8.

The main place of work of a candidate for membership in the RAS (of any of the three statuses) during the five years preceding the nomination must be research institutes and / or higher educational institutions.

**Countering the brain drain**

Recommend the directors of RAS institutes to keep the salaries of employees traveling abroad to work at universities or high-level research institutions, if the employee continues to participate in work on the planned topics of the institute and works in Russia for at least 4 months a year.

If the formulated conditions are fulfilled, members of the RAS should retain the right to receive appropriate scholarships.

**Integration of academic science and education**

The process of integrating science and education should become two-sided: along with the development of research at universities, the educational component of the activities of RAS institutes should be strengthened<sup>9</sup>. This thesis by no means contradicts what has been said above about the right of leading scientists to choose the level of teaching load themselves. However, one cannot but reckon with the fact that in our conditions the majority of doctors of sciences are

forced to teach, and this work of theirs does not in any way count towards the RAS. It is necessary to seek at least partial budgetary funding for postgraduate studies and other forms and levels of education in the RAS. The Ministry of Education could contribute to the development of competition in this area as well.

**Improving training programs: inviting Western specialists**

We have a serious shortage of teachers who are able to give courses in economics (and, I don't exclude, in other areas of knowledge) for masters and graduate students. It is not easy to find a lecturer on international economics, new political economy, industry market theory, modern labor market theory, etc. In the West, course programs are updated quickly, while in our country they are very slow. Inviting Western lecturers is an effective way of overcoming the lag, if each of the invitees is "attached" to our assistant who masters the corresponding course in order to read it in the future independently.

The available experience shows that the costs for one course should not exceed 10 thousand dollars. For 150 million rubles. (the size of one grant of the Government of the Russian Federation for state support of scientific research in universities) it would be possible to "introduce" about 500 new courses by training half a thousand teachers!

I have listed just some of the proposals that could become the subject of discussion when developing a project for the modernization of the Russian Academy of Sciences. There are many issues that I have not touched upon: the organization of the examination of dissertations, scientific journals and institutes of the Russian Academy of Sciences; formation of research plans; competitive financing; formation of funds for inviting Western scientists and internships abroad, etc. The development of such a project is the primary task of the RAS leadership.

## **REQUIREMENTS FOR THE AUTHORS OF THE JOURNAL OF ECONOMIC THEORY**

The purpose of publishing the Journal of Economic Theory is to integrate the advanced theoretical developments of economic science.

The journal publishes extensive review articles on the problems of modern economic theory, including issues of political economy, institutional economics, neoinstitutional and neoclassical theories and other theoretical views. Also, a scientific illustration of the application of economic and theoretical constructions for assessing and forecasting the development of society and the real economy is welcome.

For young scientists there is a section "Letters to the Editor".

Authors submitting their articles to the Moscow Theory Bulletin must adhere to the following formatting rules.

A4 page format. Margins - 25 mm on all sides. Font - Times New Roman 13. Line spacing - single. The volume of articles is up to 22 full pages. The volume of articles for the "Letters to the Editor" section is up to 5 full pages. The topics of the articles should correspond to the economic and theoretical orientation of the journal.

Tables and figures are embedded in the text of the article, their arrangement on the sheet should remain bookish. In this case, tables should have a title placed above the table field, and figures - figure captions. Placement of tables and figures is required in a book format. When using several tables or figures in an article, their numbering is required. Figures should be grouped. Formulas should be typed in MS Equation editor.

The article must be accompanied by a translation of the title into English, the surnames and initials of the authors in English, a brief abstract of the article in Russian and English up to one third of a page, as well as a certificate of authors indicating the full name and patronymic, position and place of work of the authors ...

Articles are subject to mandatory peer review in terms of relevance, scientific novelty, theoretical and practical significance, stylistics and compliance with the design requirements. The editors are not responsible for the content of copyrighted materials. Manuscripts will not be returned to authors.

Articles should be sent by e-mail to the executive secretary of the editorial board of the journal, Ph.D. Yurchenko Konstantin Pavlovich by E-mail:[jetrussia@yandex.ru](mailto:jetrussia@yandex.ru) or by traditional mail (with an attached diskette with the arti-

cle) by the editor-in-chief of the journal Natalia Sergeevna Solovieva at the Institute of Economics, Ural Branch of the Russian Academy of Sciences, office. 306, st. Moscow, 29, Yekaterinburg, 620014; Tel. (343) 3710254. In connection with the requirements of the Higher Attestation Commission and to improve the publishing and printing quality of our magazine, we propose changes in the design of materials.

In accordance with the "Information message on the procedure for the formation of the List of leading peer-reviewed scientific journals and publications in which the main scientific results of dissertations for the degree of doctor and candidate of sciences should be published" of the Higher Attestation Commission of the Ministry of Education and Science of Russia dated October 14, 2008 No. the design of articles are:

1. Availability of cited bibliographic lists for all articles in a unified format established by the Russian Citation Index system (GOST R 7.0.5-2008).
2. The presence of keywords for each publication.

Based on the state standards obligatory for publishers (GOST R 7.5-98 and GOST R 7.0.5. – 2008), we have developed the following guidelines for the design of materials for publication in a scientific-theoretical journal and article bibliographic lists.

The following data are required for registration of the article. Before the text of the article are placed (in the specified order):

- UDC index;
- information about the authors of the published material;
- the title of the published material;
- keywords.

After the text of the article are placed:

- article list of literature;
- annotation in Russian;
- annotation in English.

Recommendations for the design of article lists (based on GOST R 7.0.5-2008)

GOST R 7.0.5-2008 offers several options for the design of inline links and references to the bibliographic list. The editorial board, in order to maintain a single format for the entire journal, invites authors to use the following design option for links and lists.

The numbering of records in the article list is continuous (regardless of the source language).

A bibliographic list of literature is placed after the text of the article. First, a list of sources in the language of the article (Russian) is placed, the sources in it are sorted in alphabetical order (the order of the letters of the Russian alphabet). Then bibliographic records of non-Russian-language sources are placed (if the sources are in European languages, respectively, the list is sorted in the order of the letters of the Latin alphabet).

To link the cited bibliographic list with the text of the article, a reference is used, which is given in the form of numbers (ordinal numbers of the source in the cited list).

The number of the source used in the article list (in square brackets) followed by the number (s) of pages after the comma. If there are several link objects, then they are combined into one complex link. In this case, the referenced objects are listed separated by semicolons.

**Examples:** [15]; [15, p. 103-122]; [1, 15, 34]; [1, p. 235; 32, p. eighteen; 315, p. 8-22].

#### **Recommendations for the design of bibliographic records**

In accordance with GOST R 7.0.5-2008, a textual bibliographic reference may contain the following elements:

1. Title. The title of the bibliographic record of a mono edition with no more than three authors is the author's name (first, the surname, after the surname - initials; or a pseudonym). The bibliographic record contains the names of the author or all authors. (If there are more than three authors, then the source record in the list begins with the main title. In this case, the names of the authors are indicated in the data on responsibility in the order in which they are indicated in the publication. Only the surname and initials of the first author with the record "etc. .").

2. The main title. The main title can be the title of a mono edition written by one or more authors, the title of an article from a collection or part of a publication written by the author or authors referred to in the text. In this case, after indicating the name of the author (authors) and the main title, after two slashes, the title of the collection or publication is indicated, part of which is included in the list of references as an independent source; the names of the editors and other information about the publication as a whole are indicated.

3. Information related to the title. Information related to the title contains, for example, data on the type of publication by the nature of the information: monograph, abstract, preprint, abstracts, conference materials, collection of scientific papers, manual, textbook, reader, etc.), indication of the language from

which the translation was made , if the publication is translated, the number of volumes, etc.

4. Statement of responsibility. Information on responsibility may contain the names of the group of authors of the mono-publication, the names of scientific and other editors of the collection, the names of the translators, the name of the organization on whose behalf the publication was carried out (stamp), etc.

5. Information about the edition. Information about the edition contains data such as the serial number of the reprint, data on revisions and additions, etc.

6. Output data. The imprint contains information about the place of publication, the name of the publisher and the date of issue. Place of publication - the name of the city (official abbreviations are used to record the cities of Moscow, St. Petersburg and a number of others). For periodicals, the output data is the year, number, date (for newspapers) of issue. If the book is published jointly by two publishing houses located in different cities, then they are given in turn, separated by semicolons (see example 1).

7. Physical characteristics of the document. Physical characteristics include, for example, the total number of pages in a book or the type of electronic resource (website).

8. Information about the series. The name of the series is given without the word “series”, in parentheses.

9. Sequential number of the volume or issue. The volume or issue number is indicated if the reference comes to a source from a serial or multi-part edition.

10. Notes. Information on the availability of illustrations, tables and other information can be provided.

*Examples of*

1. Mono edition with two authors.

Kovshikov V.A., Glukhov V.P. Psycholinguistics: theory of speech activity: textbook. manual for students of pedagogical universities. M.: Astrel; Tver: AST, 2006.319 p. (Graduate School).

2. A mono edition with more than three authors.

Socio-economic substantiation of structural transformations in mining areas / E.M. Kozakov, V.M. Popov, A.A. Rozhkov et al. Yekaterinburg: Institute of Economics, Ural Branch of the Russian Academy of Sciences, 2000.

A Brief Dictionary of Economics / A. N. Azriliyan et al. 2nd ed., Revised. and add. M.: Institute of a new economy, 2002.1087 p.

3. An article in the collection.

Danilina G.A. Characteristics of the immune status of children permanently residing in the zone of influence of nuclear industry enterprises // Materials of

the VII Congress of the All-Russian Islands of Epidemiologists, Microbiologists and Parasitologists (July 2-8, 2002). M.: Ekos, 2002.435 p.

4. Article in the journal.

Adorno T.V. To the logic of social sciences // Vopr. philosophy. 1992. No. 10.

Features of compiling links to electronic resources

GOST R 7.0.5-2008: "The objects of compiling a bibliographic reference ... are electronic resources of local and remote access. Links are made both to electronic resources in general and to components of electronic resources (sections and parts of electronic documents, portals, web pages, publications in electronic serials, messages on forums, etc.) "

Links to electronic resources are made according to the same rules as a link to sources on paper.

An indication of the form of the media (disk) is placed after all information about the object of reference (compiled in the above order) - for example, after the data on the number and release date of the electronic journal in which the described material is placed ("Note"), - in square brackets (see examples).

If the object of the link is a site, then the word "site" is placed in square brackets. For electronic resources of remote access, it is allowed to use the abbreviation "URL" (Uniform Resource Lokator) instead of the words "access mode" to denote the electronic address, after which information about the protocol for accessing the network resource (ftp, http, etc.) is given, separated by a colon. NS.). After the e-mail address in parentheses, information about the date of access to the electronic network resource is given: after the words "date of access", the date, month and year are indicated (see examples).

A note about limited availability is given in links to documents from local networks, as well as from full-text databases, access to which is carried out on a contractual basis or by subscription (for example, "Code", "Garant", "ConsultantPlus", "EDSCO", "ProQuest", "Integrum", etc.)

*Examples of*

1. Dirina A.I. The right of the military personnel of the Russian Federation to freedom of association // Military law: network journal. 2007. URL:<http://www/voennoepravo.ru / node / 2149> (date of access: 19.09.2007).

2. On the housing rights of scientists [Electronic resource]: Resolution of the All-Russian Central Executive Committee, SNK RSFSR of 20 Aug. 1933 (as amended and supplemented by resolutions of the All-Russian Central Executive Committee, SNK RSFSR dated November 1, 1934, dated June 24, 1938). Access from the reference legal system "ConsultantPlus".

3. Encyclopedia of Animals by Cyril and Methodius. M.: Cyril and Methodius: New media generation, 2006.1 electron. wholesale disc (DVD-ROM).

4. Latchford E.W. With the White Army in Siberia // Eastern Front of the Army of Admiral A.V. Kolchak: [site]. URL: <http://east-front/narod.ru/memo/latchford/htm> (date accessed: 23.08.2007).

Fulfillment of the requirements for the design of materials for publication will bring the form of our journal closer to the standards, a complete and systematic design of article lists will facilitate the work of the Scientific Electronic Library to promote Russian scientific publications on the Internet and create a national bibliographic database for scientific periodicals.